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Bioslurping/Bioventing Demonstration in Tight Soils at Tinker Air Force Base Southwest Tanks Site

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13. ABSTRACT (*Maximum 200 words*)

Innovative bioremediation technology was evaluated for its effectiveness at removing petroleum hydrocarbon contaminants from a site featuring clay soils underlain by a partially-cemented sandstone with an extensive smear zone. Smear zone was dewatered to facilitate soil aeration and the clay layer was aerated by forced air injection. Significant mass removal mechanisms included volatilization and biodegradation.

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PREFACE

This report was prepared by Battelle Memorial Institute, 505 King Avenue, Columbus, OH 43201, under Contract No. FO8637-95-D-6004 with the Environics Directorate of Armstrong Laboratory (AL/EQ), 139 Barnes Drive, Suite 2, Tyndall AFB, FL 32403. Funding was supplied for this effort by Tinker Air Force Base (OC-ALC/EMR), Tinker AFB, OK 73145.

This report describes the demonstration and evaluation of an innovative bioremediation system to dewater and remove petroleum hydrocarbon contamination from a site with tight clay soil overlaying a partially-cemented sandstone layer with an extensive smear zone. Contaminants trapped below the water table were exposed to elevated oxygen concentrations by dewatering and aerating the soils. Aeration was accomplished using an extraction liquid-ring pump which withdrew soil vapors from multiple wells. Significant mass removal mechanisms included volatilization and biodegradation of the petroleum hydrocarbon contaminants.

This work was performed between October 1995 and July 1996. The Contracting Officer's Technical Representative (COTR) at Tinker AFB was John Mills, and the Project Managers at the Environics Directorate of the Armstrong Laboratory were Lt. David Kuch and John Spivey.

EXECUTIVE SUMMARY

A. OBJECTIVE

The objective of this document is to report the results of the demonstration of the bioslurping/bioventing system at Tinker Air Force Base, Oklahoma, Southwest Tanks (SWT) Site. The objective of this project was to demonstrate and evaluate the use of bioslurping for hydrocarbon destruction and aquifer dewatering to facilitate biodegradation of contaminants in an extensive smear zone overlain by tight clay soils. The purpose of using bioslurping/bioventing technology at the site was to aerate the tight clay layer while simultaneously dewatering and aerating the smear zone in the partially-cemented sandstone layer below it. The aeration of both layers was intended to enhance the biodegradation capacity of the soil layers and remove the hydrocarbon contamination.

B. BACKGROUND

This project was originally funded as an Innovative Technology Demonstration (ITD) through Tinker AFB and the U.S. Department of Energy (DOE). In October 1995, completion of the project was funded through the Environics Directorate of the Armstrong Laboratory, Tyndall AFB, FL. This report describes the activities from October 1995 through June 1996 conducted for the Environics Directorate.

The ITD work was conducted in two phases. Phase I of the ITD work included an investigation of the tanks and monolith, vent piping, and soils adjacent to the monolith, and was completed in July 1994. Phase II of the ITD involved construction and installation of the bioremediation system. A Field Activity Report was submitted to Tinker AFB that described the Phase II field activities performed during construction and installation of the bioremediation system.

The SWT Site was a former storage facility and consists of seven abandoned underground storage tanks (USTs) and a sump are enclosed in a concrete monolith. The USTs previously had contained fuel (JP-4), oil, and solvents and were abandoned in 1968. After the tanks were abandoned they were partially filled with sand and gravel.

Four groundwater zones have been identified at the SWT Site: (1) the perched groundwater zone; (2) the shallow top-of-the-regional-zone; (3) the deeper regional zone; and (4) the deep producing zone. The vadose and perched groundwater zones are the zone of interest for this remediation demonstration.

The upper 1 to 3 feet of soil at the SWT Site consists of a muddy sandy gravel that was used as backfill. Near the concrete monolith, this back fill extends to a depth of 15 feet. Below the backfill lies 12 to 18 feet of clay/silty clay which is thickest toward the west. In most locations, the bottom of this unit is marked by a 0.3-foot-thick layer of gray silt, and 5 to 10 feet of silty sand lies below the clay/silty clay layer. The silty sand grades to medium and coarse sand which extends down to shale at approximately 38 feet.

The perched aquifer occurs above the shale in the sand unit. The depth to water typically fluctuates between 16 and 20 feet below ground surface, although the large hydrocarbon smear zone indicates that greater fluctuations have occurred in the past. Depth to water and depth to product were measured in all wells upon their completion. The depth to water at that time was between 19

and 20 feet. Four feet of free product was found in one well near the concrete monolith, with much smaller layers of free product in wells at the south-central portion of the site.

C. SCOPE

The scope of this project was to inspect, operate and maintain the bioslurping and bioventing system at the SWT Site for a period of six months. Due to a period in which funding was unavailable, the bioremediation system at the SWT Site was idle for almost a year prior to the start of this project. In order to detect and correct maintenance issues caused by the idle period, a system inspection phase was included in the scope of this project. Following inspection, a shake down phase ensured that system components were operating properly. Operation and maintenance of the bioslurping and bioventing system included testing procedures necessary to evaluate the contaminant removal efficiency of the system. Waste streams managed by the project included extracted groundwater, soil vapor off-gas from the liquid ring pump, free product recovered, and decontamination fluids. Finally, an operation and maintenance (O&M) manual and this final project report were produced for project documentation.

D. METHODOLOGY

Twenty bioslurper wells were installed to the shale layer at a depth of 38 feet to facilitate (1) free product removal, (2) site dewatering, and (3) smear zone aeration. The bioslurper wells were manifolded and valved in such a manner as to produce an extremely flexible system with many slurping and passive aeration configurations. As a system operation test, all 20 wells were turned on to actively slurp simultaneously for a period of time. Due to unbalanced water production from the various wells, the system operation was later optimized by operating 5 to 10 bioslurper wells for water and soil gas extraction. This configuration was demonstrated to adequately dewater the site while reducing the soil gas extraction rate.

The shallow bioventing system consists of 19 shallow air injection vent wells powered by a 5 horsepower carbon vane blower capable of achieving 15 psig. The system was routinely operated at a pressure of 13 psig. Immediately after the shallow bioventing system startup, little or no flow could be observed in any of the vent wells which were screened within the clay layer. After 4 days of maintaining 13 psig on the injection manifold several of the wells began to accommodate flow up to 2 cubic feet per minute (cfm). Eventually all vent wells accommodated at least 0.25 cfm, and some as much as 4 cfm at the operating pressure.

To help manage the extracted soil gas flow stream concomitant with bioslurping and dewatering operations, a post-pump injection manifold was constructed with appropriate valves to facilitate the re-injection of the soil vapor extracted from the site. This very flexible system modification enables the site manager to use any bioslurper well on the site to either (1) actively withdraw fluid (water and soil vapor), (2) allow passive aeration into the subsurface, or (3) re-inject soil vapor.

E. TEST DESCRIPTION

Contaminant removal rates were quantified by monitoring the concentration and volume of groundwater extracted from the site, concentration and flow rate of soil vapors extracted by the liquid ring pump, and biodegradation rates throughout the site.

The cumulative extracted groundwater volume was measured by a total flow meter positioned in the transfer line between the temporary storage tank and the two 6,000-gallon storage tanks. In addition, observations of the volume of water transferred to the large storage tanks were recorded in the field log book. The contaminant concentration in the water was monitored by collecting water samples from the storage tanks. These samples were sent to an independent laboratory for TPH and BTEX analysis.

Soil vapor flow rate was monitored daily by technicians reading a differential pressure on a pitot tube and converting that differential pressure to flow rate using a manufacturer-provided nomograph. Soil vapor concentrations were also monitored daily by technicians using field TPH, O_2, and CO_2 meters. To confirm the field meter concentrations, 10 soil vapor samples were collected into Summa canisters and sent to an independent laboratory for TPH and BTEX analysis.

Biodegradation rates were monitored site-wide by calculating the total oxygen utilized as the difference between ambient air oxygen concentration and that found in the extracted soil vapor. A stoichiometric conversion was utilized to yield the mass of hydrocarbon biodegraded. In addition, three in situ respiration tests were performed at distinct location, multilevel soil gas monitoring points. In situ respiration tests yield a biodegradation rate for each sampling point. The results from all the sampling points at which in situ respiration tests were performed were averaged to produce an average site biodegradation rate. The biodegradation rates produced by these two alternative methods compared very favorably.

F. RESULTS

The bioremediation system removed a total of 11,000 kg of TPH (24,000 lb TPH) in a total of 8 months of on-site operations through volatilization, contaminated groundwater removal, and biodegradation. Most of the TPH (9,900 kg [22,000 lb]) was removed between January 1996 and the end of the demonstration. During this time, the average TPH removal rate was 66 kg/day (150 lb/day). The most significant removal process was via the extraction of soil gas by the liquid ring pump. this removal process is similar to soil vapor extraction (SVE), but has two significant differences: (1) the objective of the system is to dewater the site and maximize biodegradation, not to maximize volatilization as with SVE; and (2) the vapor flow rates required to accomplish system objectives are at least on order of magnitude lower than those that would accompany an SVE system. Removal of vapor-phase contaminants accounted for 79.7% of the total TPH removed during system operations. Bioremediation accounted for the 20.0% of the total TPH removed from the site, and groundwater extraction (comparable to pump and treat) removed only 0.3% of the total. Biodegradation rates averaged >400 mg/kg-yr and overall removal rates reached 2,000 mg/kg-yr.

G. CONCLUSIONS

This was the first demonstration to use a bioslurping system to dewater a large volume of aquifer sediments. Operational data obtained in this demonstration have proven that the installed bioslurper system has the power and capacity to extract over 600 gallons of groundwater per hour from 32 feet below ground surface. Soil gas monitoring revealed that the system was also more than adequate to the task of aerating the dewatered soils. In situ respiration tests and site-wide oxygen utilization rates indicated that significant biodegradation was occurring in the soils at the site. Therefore, the system objectives of dewatering and aerating the contaminated soil sites below the natural water table were satisfied. Soil gas monitoring from points located within the clay layer showed that those locations were also adequately aerated. This indicates that the shallow injection system was successful at pushing water out of the fractures in the clay and facilitating air flow within that layer.

The construction of this bioremediation system includes valves on every injection and bioslurping well. This makes the system very flexible and capable of being configured in a great variety of ways. Bioslurping (dewatering), passive air injection, and stack gas re-injection are possible at each bioslurper well. Therefore, different areas of the site can be utilized for alternate purposes (such as stack gas re-injection) if desired.

H. RECOMMENDATIONS

The relatively high groundwater extraction rate required to maintain the site in a dewatered condition necessitates a relatively high soil gas extraction rate. This results in more volatilization than would occur during just bioventing. Soil gas monitoring activities demonstrated that the dewatered aquifer sediments were experiencing more vapor flushing than was necessary to support in situ biodegradation. This fact reveals an opportunity to reduce soil gas extraction rates while maintaining the "slurping" action of the fluid extraction wells and still providing adequate oxygen to support biodegradation.

In the event that vapor emissions from the liquid ring pump become a regulatory issue, it is recommended that the stack gas from the pump be re-injected into the formation for bioremediation. Alternatively, above-ground treatment units such as biofilters may be installed to treat the off-gas. When the vapor mass flow rates become adequately low to make it feasible, the existing carbon canisters may be employed to clean the stack emissions.

It is recommended that the system be operated as aggressively as possible until the stack gas TPH concentrations and in situ biodegradation rates are minimized. At that time it will be feasible to perform final soil sampling for site closure. It is not recommended to collect soil samples before concentrations and rates are minimized, because elevated TPH concentrations and significant biodegradation rates are indicators of existing subsurface contamination.

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ACRONYMS AND ABBREVIATIONS

acfm	actual cubic foot (feet) per minute
AFB	Air Force Base
AI	air injection (well)
ASTM	American Society for Testing and Materials
BGL	below ground level
BPND	Battelle Pacific Northwest Division
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDM	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfm	cubic foot (feet) per minute
EMO	Environmental Management Operations
EPA	United States Environmental Protection Agency
gph	gallons per hour
gpm	gallons per minute
ID	identification
ITD	Innovative Technology Demonstration
MSL	mean sea level
NJIT	New Jersey Institute of Technology
O&M	operations and maintenance; Operations and Maintenance (Manual)
OCC	Oklahoma Corporation Commission
OD	outside diameter
OHM	OHM Remediation Services Corporation
PNL	Pacific Northwest Laboratory
PVC	polyvinyl chloride
SG	soil gas
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWT	Southwest Tanks
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
USAF	United States Air Force
UST	underground storage tank
VOC	volatile organic compound

SECTION I
INTRODUCTION

This project was conducted to demonstrate the potential of bioremediation to treat a contaminated fuel storage site at the Southwest Tanks (SWT) Site, Tinker Air Force Base (AFB), Oklahoma. This project originally was funded as an Innovative Technology Demonstration (ITD) through Tinker AFB and the U.S. Department of Energy (DOE). In October 1995, completion of the project was funded through the Environics Directorate of the Armstrong Laboratory, Tyndall AFB, FL. This report describes the activities from November 1995 through June 1996 conducted for the Environics Directorate.

The ITD work was conducted in two phases. Phase I of the ITD work included an investigation of the tanks and monolith, vent piping, and soils adjacent to the monolith, and was completed in July 1994. Phase II of the ITD involved construction and installation of the bioremediation system. A Field Activity Report was submitted to Tinker AFB that described the Phase II field activities performed during construction and installation of the bioremediation system.

The focus of this report is on the data obtained during operation of the bioremediation system from November 1995 through the end of June 1996. This report briefly describes the background and characterization of the SWT Site. More detailed information can be found in the Field Activity Report (PNL, 1994a). An overview of the operating system is presented and the main components of the system are discussed. Operational procedures for running the system are detailed in a separate Operations and Maintenance (O&M) Manual submitted to the Air Force under separate cover. An evaluation of the system operations and recommendations for modifications are provided to facilitate future site remediation operations.

A. OBJECTIVES

The objectives of the bioremediation demonstration and description of the activities conducted to support these objectives are described below:

1. *Operate an in situ bioremediation process to address the "source" contamination located in and around the tank vault.* The installed system concentrated on biodegradation and vapor stripping of product and treating the residual contamination found in the contaminated soils in both the fractured clay and partially cemented sandstone.

2. *Collect the data necessary to evaluate bioslurping system performance and recommend necessary design modifications to achieve closure of the SWT Site.* This included the development of procedures and recommendations for extended operation of the system to achieve closure of the site.

A summary of site features, hydrogeologic characteristics, and previous site activities is provided in this section. Further background information including results of previous investigations at the SWT Site can be found in the following documents:

- Building 3001 Record of Decision (COE, 1990)
- Building 3001 Remedial Investigation Reports (COE, 1988; COE, 1991)
- Innovative Technology Demonstration Site Characterization Report, E-105 and Tanks Site (CDM, 1992a)
- Soil Gas Extraction Pilot Test Work Plan, Tanks Site (CDM, 1992b)
- Soil Gas Extraction Pilot Test Technical Report, Tanks Site (EMO, 1993a)
- Site Assessment for Tanks Area (EMO, 1993b)
- Tank and Monolith Investigation Summary Report, Tanks Area (PNL, 1994b)
- Pneumatic Fracturing Demonstration Report, Tanks Area and North Tanks Area (NJIT, 1994).

B. SITE BACKGROUND

Activities conducted prior to installation of the bioremediation system at the SWT Site have included site characterization, soil gas permeability studies, in situ respiration studies, helium tracer studies, and pneumatic fracturing. Results from these activities have been used to develop the bioremediation design described in this document. A summary of these studies is provided in this section.

1. Site Characterization of Soils

Results of previous site characterization studies and subsequent drilling and sampling activities including the recent tank investigation work (PNL, 1994b) have revealed that the fuel

contamination source most likely is the tank vault, where overfilling of the tanks probably resulted in excess fuel moving into the subsurface through a series of vent lines for the pump pits and the tanks. Previously, the pump pits and tanks were filled with coarse sand and gravel and were closed without sealing the access openings to the pump pits or tanks. As a result, surface water recharged freely into the pump pits and tanks, and leaked back out into the subsurface. The tanks were found saturated with water. Contents of the individual tanks and sump were sampled and analyzed. The preliminary results confirmed the results of a previous investigation conducted in 1988 and indicated that only one tank, 3144, and the Sump Area contained significant amounts of benzene, toluene, ethylbenzene, and xylenes (BTEX).

These contaminants have migrated laterally and vertically from the tanks into the soil column. Soil contamination resides in the upper 10 feet of clay soil, the sand/sandstone located from 10 feet below ground level (BGL) to the high perched groundwater level at approximately 16 feet BGL, and to depths of 16 to 35 feet BGL in the saturated sediments of sand/sandstone resulting from fluctuations in the perched groundwater.

2. Soil Gas Permeability Analysis

Previous laboratory analyses to determine permeability from soil cores at various depths showed permeabilities generally ranging from 10^{-7} cm/sec in the upper clay layer (0 to 10 feet BGL) to 10^{-5} cm/sec in the lower sand/sandstone layer. Field soil gas permeability tests conducted at the site under 180 inches of water vacuum seemed to confirm this general trend of two orders of magnitude increase in permeability at the deeper depth in sand/sandstone (10 to 35 feet BGL). Soil gas extraction tests showed very low gas flows in both zones ranging from essentially zero to less than 3 cfm at very high vacuum, demonstrating that using high-vacuum extraction is not effective in moving air into the shallow clay formation.

These results were very similar to the results of the soil gas permeability test conducted at a nearby site, the North Tanks Area. One possible explanation for the observation of very low gas flow rates compared to the measured soil gas permeabilities is the presence of high moisture levels in the soil. High vacuum alone resulted in pulling the perched water table up into the soil column. In contrast, with the use of injection pressure, air flow rates increased substantially after approximately 2 days of continued pressure application, indicating that air injection helped to displace the water and facilitate vapor flow. Based on this empirical evidence, it appeared the best method to achieve and

maintain the shallow air injection rates was through pressurized shallow air injection combined with vacuum-assisted groundwater extraction in the deeper sandstone layer.

3. In Situ Respiration Studies

Initial in situ respiration studies conducted in the clay and sandstone layers using air injection at 1 cfm (15 psi) showed that average biodegradation rates of 10 mg/kg-day could be achieved across the site. Biodegradation rates generally increased with increasing contamination levels. These results indicated that microbial activity was high at the site and bioremediation was a promising remediation alternative provided that oxygen could be adequately supplied.

4. Pneumatic Fracturing

A pneumatic fracturing demonstration was performed at the SWT Site between May 15 and August 15, 1993. Results of air/helium injection tests conducted as part of this demonstration showed that prior to pneumatic fracturing there was significant natural fracturing or channeling already at this site. This was determined by monitoring helium travel times from an injection well to a series of multilevel monitoring points. The fact that the helium traveled very rapidly to the entire series of multilevel points that were staggered at 1-ft intervals from 7 feet BGL down to 20 feet BGL indicated that the site has extensive fractures or channeling. These channels should provide a minimum diffusion path length of 1 foot or less, which has been determined by modeling to be adequate for supplying the biological oxygen demand in the clay (Appendix A). Overall, the pneumatic fracturing process appeared to have enhanced existing channels and enhanced air flow.

In addition, the air injection and helium tracer tests demonstrated that low-flow air injection potentially could be used to deliver oxygen to both the clay and sandstone layers of the contaminated soils. Model results of air injection, using data from subsequent soil gas permeability tests that were conducted as part of the fracturing demonstration at the SWT Site, showed that oxygen can be delivered adequately in the lower, more permeable sand formation.

5. Site Description

a. Site Features

The SWT Site was a former storage facility and consists of seven abandoned underground storage tanks (USTs) and a sump area enclosed in a concrete monolith. The USTs previously had contained fuel (JP-4), oil, and solvents and were abandoned in 1968, at which time they were partially filled with sand and gravel.

b. Hydrogeologic Features

The SWT Site soil formation is characterized as the Garber-Wellington Formation, which consists of lenticular and interbedded sandstone, shale, and siltstone. Four groundwater zones have been identified: (1) the perched groundwater zone; (2) the shallow top-of-the-regional zone; (3) the deeper regional zone; and (4) the deep producing zone. The vadose and perched groundwater zones are the zones of interest for this remediation demonstration.

The upper 1 to 3 feet of soil at the SWT Site consists of a muddy sandy gravel that was used as backfill. Near the concrete monolith, this backfill extends to a depth of 15 feet. Below the backfill lies 12 to 18 feet of clay/silty clay which is thickest toward the west. In most locations, the bottom of this unit is marked by a 0.3-ft-thick gray silt, and 5 to 10 feet of silty sand lies below the clay/silty clay. The silty sand grades into a medium to coarse sand which extends down to a shale at approximately 38 feet. Throughout the sand are lenses of highly cemented sand and some interbedded silts. Five cross sections were constructed from the geologic logs to help visualize the hydrogeologic setting at the site. These cross sections are found in the Field Activity Report (PNL, 1994a).

The perched aquifer occurs above the shale in the sand unit. The depth to water typically fluctuates between 16 and 20 feet below ground surface, although the large hydrocarbon smear zone indicates that greater fluctuations have occurred in the past. Depth to water and depth to product were measured in all wells upon their completion. The depth to water at this time was between 19 to 20 feet. Four feet of free product was found in one well near the concrete monolith, with much smaller layers of free product in wells at the south-central portion of the site.

C. PROJECT SCOPE

The scope of the project was (1) to demonstrate and evaluate the use of bioslurping for hydrocarbon removal and destruction, and (2) to investigate the use of the bioslurper system for aquifer dewatering in order to expose contaminated soils to bioventing.

SECTION II
SYSTEM INSTALLATION

This section provides a summary of the design rationale for the bioremediation system as well as a summary of the final installations.

A. DESIGN RATIONALE

The remedial design for the SWT Site tanks, monolith, and soils was based on the findings during the site characterization and the various treatability tests that were conducted. Tank 3144 and the Sump Area were intended to be treated primarily through soil vapor extraction (SVE), while the remainder of the site was remediated through bioslurping for the deep contamination and bioventing for the shallow clay layer. The technologies are described in the following sections.

1. Tank 3144 and the Sump Area Remediation System

The residual contamination in Tank 3144 and the Sump Area was originally intended to be treated through soil vapor extraction. Soil vapor extraction refers to the withdrawal of soil gas for maximizing the volatilization of low-molecular-weight, volatile organic compounds (VOCs). The approach to remediating Tank 3144 and the Sump Area was changed during the project because of the rapid recharge of water into these areas. It was determined that a more efficient remediation approach was to connect the vent wells in Tank 3144 and the Sump Area to the bioslurping system. In this way, dewatering and vapor extraction were accomplished simultaneously. Consequently, remediation of Tank 3144 and the Sump Area were no longer a separate remediation system, but became part of the bioslurper system. Installations in these areas are discussed separately in Section IIB, but system operation, monitoring, and results are discussed as a part of the bioslurper system in subsequent sections.

2. Bioslurping and Shallow Bioventing Remediation System

Because of water table fluctuations, a significant fraction of the fuel contamination at the SWT Site was found below the water table between 20 and 32 feet. To remediate the entire site, dewatering was necessary to expose contamination present below the water table to bioventing.

Bioslurping was chosen as a method that could simultaneously draw down the water table and remove free product if necessary through vacuum-enhanced removal, and simultaneously biovent the contaminated soils. Bioventing is the process of aerating subsurface soils via injected or extracted air to increase in situ biological activity and to promote bioremediation (Hinchee et al., 1992).

During bioslurping, high free-product-recovery efficiencies are achieved with a pressure-induced gradient rather than by the hydraulically induced gradient used by many free-product-recovery systems. Previous bioslurper systems were designed to take advantage of this while minimizing environmental discharges of soil gas. As done in bioventing, most bioslurper systems extract soil gas at a low rate to reduce volatilization of contaminants. The rate of soil gas extraction is inversely dependent on the recovery rate of liquid into the well. In some instances, volatile discharges can be kept below treatment action levels; if volatile discharges are high and the site geology permits efficient reinjection, the extracted soil gas may be reinjected into the soil for further in situ treatment.

Operations at the SWT Site, however, used the bioslurper in a manner that had not been evaluated before this project. Dewatering using a bioslurper system has been effectively demonstrated at other sites; however, the SWT Site bioslurper system was designed to dewater a larger area to a greater depth than in any of the other demonstrations.

Although bioslurping was capable of aerating the lower, more permeable soil layer at the site, modeling efforts indicated that the shallow, less permeable clay layer would not be aerated sufficiently. Therefore, air injection wells were installed in the clay layer for bioventing of the contamination in this area.

The bioremediation design focused on the "source" contamination located within a soil region defined by the 1,000-ppm TPH contour. This contour was chosen because the site required a cleanup level of category III soils based on the Oklahoma Corporation Commission (OCC) *General Rules and Regulations Governing Underground Storage Tanks in Oklahoma* (effective January 6, 1992). Calculation of the site-specific soil and groundwater remediation index is shown in Table 1, and was based in part on the recent index calculation for the North Tanks Area. The calculation yields an index value of 76 which places the soils and groundwater at the SWT Site in Category III. The OCC-recommended cleanup standards for a category III site are the following:

Soil B/T/E/X (mg/kg)	10/1,000/1,000/1,000
Soil TPH (mg/kg)	1,000

Table 1. Calculation of Site-Specific Soil and Groundwater Remediation Index[1]

Site Feature/Risk Factor	Site Characteristic	Points Given
Estimated Quantity Released	>1,000 gal	0
Water Quality in Total Dissolved Solids	5,000 ppm	10
Distance to Water Well from Tank Pit	>1,320 ft	10
Unique Site Features	Soil and Well Borings	5
Soil Medium	Clays/Sands	5
Depth of Utility Lines	Above Groundwater	10
Average Annual Precipitation	32 inches	6
Land Use or Zoning	Industrial	10
Depth to (Potable) Groundwater	<100 ft	10
Soil Cover on Tank Pit	Broken Concrete	5
Hydrologically Sensitive Areas	Yes	5
Total		76

1 Use of this calculation assumes that the SWT Site is not within a "ten year travel time" wellhead protection region.

Groundwater B/T/E/X (mg/L)	0.5/200/70/1,000
Groundwater TPH (mg/L)	25

It is difficult to predict the amount of time required to close the SWT Site. The thickness of the free-floating product has been measured at about 6 feet deep in some places. With the free product removed and with an average value for petroleum contaminant removal of 66 kg TPH/day (150 pounds TPH day) (see Section IVB3), some of the highly contaminated zones at SWT Site will require a remediation time to closure of 4 to 6 years. In light of this, the performance evaluation criterion for this demonstration was to document significant contaminant reduction, through removal and destruction of contamination at the SWT Site. This demonstration will be evaluated by the following criteria: (1) mass of contaminant biodegraded; (2) mass of contaminant removed by bioslurping vapor extraction; (3) mass of contaminant removed as free product; and (4) mass of dissolved contaminants in water sent to the wastewater treatment plant.

B. SYSTEM INSTALLATIONS

An overview of the site preparation activities, well installations, and aboveground components for the bioremediation system is provided in this section.

1. Site Preparation

Some site preparation was performed in advance of other work. Site preparation activities undertaken at the SWT Site before new well installation began included abandonment of existing wells, a general site cleanup, and site grading. Well abandonment was necessary to control air flow through the subsurface during air injection and extraction efforts.

The general site cleanup consisted of removing debris from the site; relocating Tinker AFB equipment, trailers, pallets, and boxes to an area south of the most southerly new well installation; and removing well abandonment materials (concrete pads, well boxes, metal posts) to a staging area northwest of the SWT Site gate.

OHM Remediation Services Corporation (OHM) performed site grading so that runoff at the SWT Site would drain generally to the west. An area of approximately 75 feet by 90 feet was graded. OHM used a bulldozer to grade the existing gravel at the site and fill existing holes and depressions to level the site, then provided clean clay and formed a slope from east to west, beginning

approximately 5 feet west of groundwater monitoring wells 1-93 and 1-94. The clay is approximately 8 inches thick near groundwater monitoring wells 1-93 and 1-94 and 2 inches thick on the western edge. The clay was compacted and covered with a 2-inch-thick gravel blanket so heavy equipment (i.e., drilling rigs) could drive on the graded area without sinking. Care was taken to not damage or destroy existing structures (i.e., wells, fencing).

2. Tank and Sump Remediation System

A passive vent well and an extraction point were installed in Tank 3144 and the Sump Area in September 1994. The top of the tank was estimated at 5.5 feet BGL. Upon puncturing through the tank, the augers dropped approximately 6 feet, indicating void space above the fill in the end of the tank. Fill was visible through the manhole near the center of the tank. The total depth from West Drive to the bottom of Tank 3144 is approximately 15.5 feet.

The passive vent well in Tank 3144 was installed using a hollow-stem auger rig. A 6.25-inch-diameter hole was drilled through the top of the east end of the monolith and tank, in the southbound lane of West Drive (Figure 1). The passive vent is constructed of 2-inch-diameter, schedule 40, flush threaded polyvinyl chloride (PVC) casing and screen (Figure 1). The screen has a slot width of 0.010 in (10-slot screen), is 4 feet in length, and includes an end cap. No annular seal materials were placed within the tank because of the void space. A 6-inch-diameter sleeve, with a rubber seal and expansion bolts, was affixed to the 2-inch casing above the top of the tank. Cement grout to 3 feet BGL and concrete to 1 foot BGL were placed in the annular space above the sleeve. Street access to the vent is provided through a 12-inch-diameter manhole cover, flush with West Drive. The vent is accessible for air flow through piping in the top of the concrete pad plumbed beneath West Drive.

A 12-inch-diameter, schedule 40 PVC sampling port was placed within the 18-inch manhole in the pump pit (Figure 1). The sampling port is set atop the fill in the manhole and extends 10 feet upward, through the concrete pad. A plywood cover, grouted to the manhole lip, was used to secure the sampling port in place. Additionally, the existing 2-inch-diameter galvanized steel well point was modified such that the 10-foot screen was replaced with a 2-foot section of 10-slot screen (Figure 1). This well point extends to the bottom of the tank and upward through the concrete pad.

The passive vent well in the Sump Area was installed in the northeast corner using the hollow-stem auger sampling hammer. This vent is an externally coupled, galvanized steel well point (Figure 2). A 10-slot screen extends from 6 feet BGL to the bottom of the sump at 10 feet BGL.

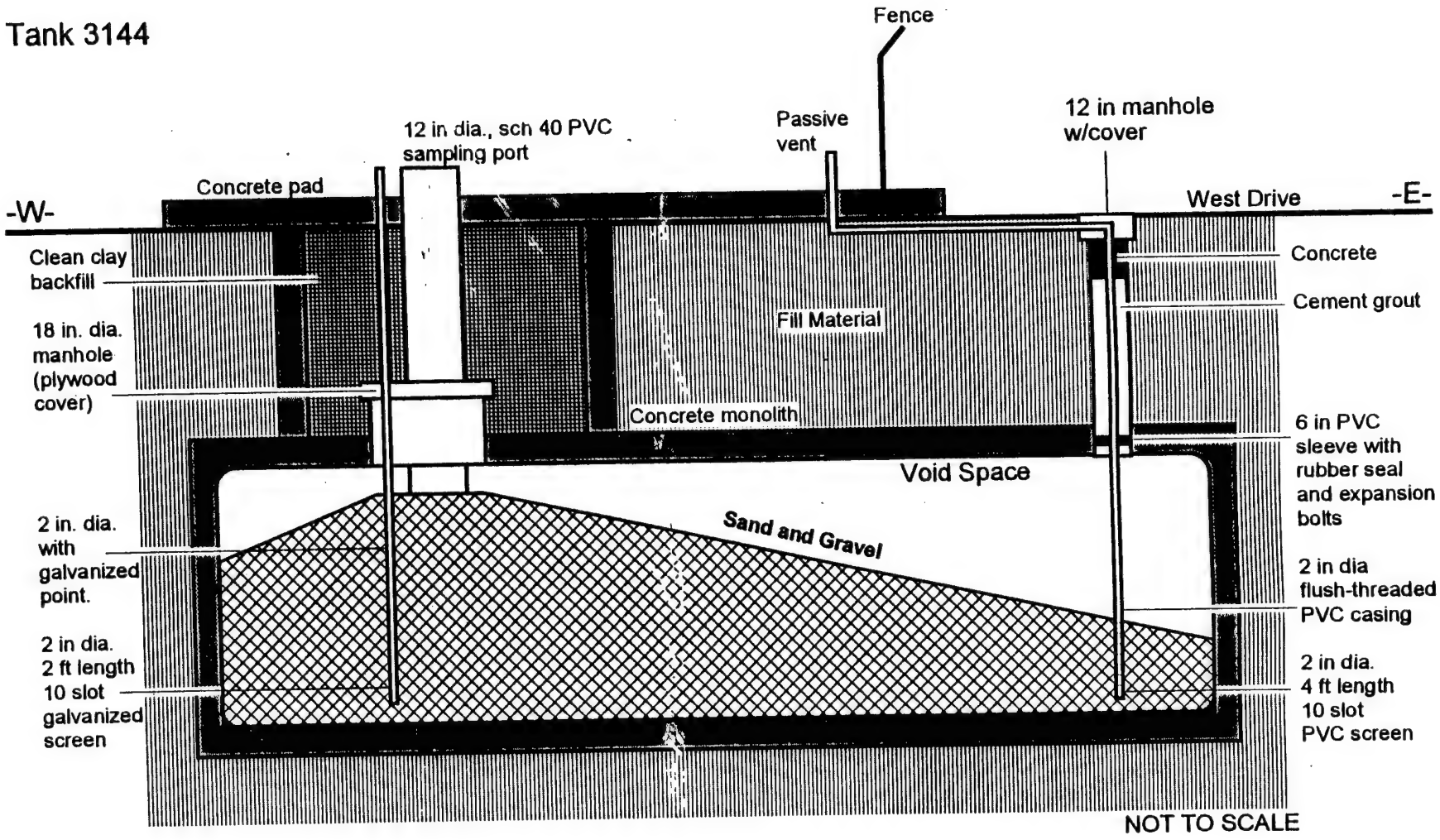

Figure 1. Cross Section of Tank 3144 Showing Construction Details of Installations

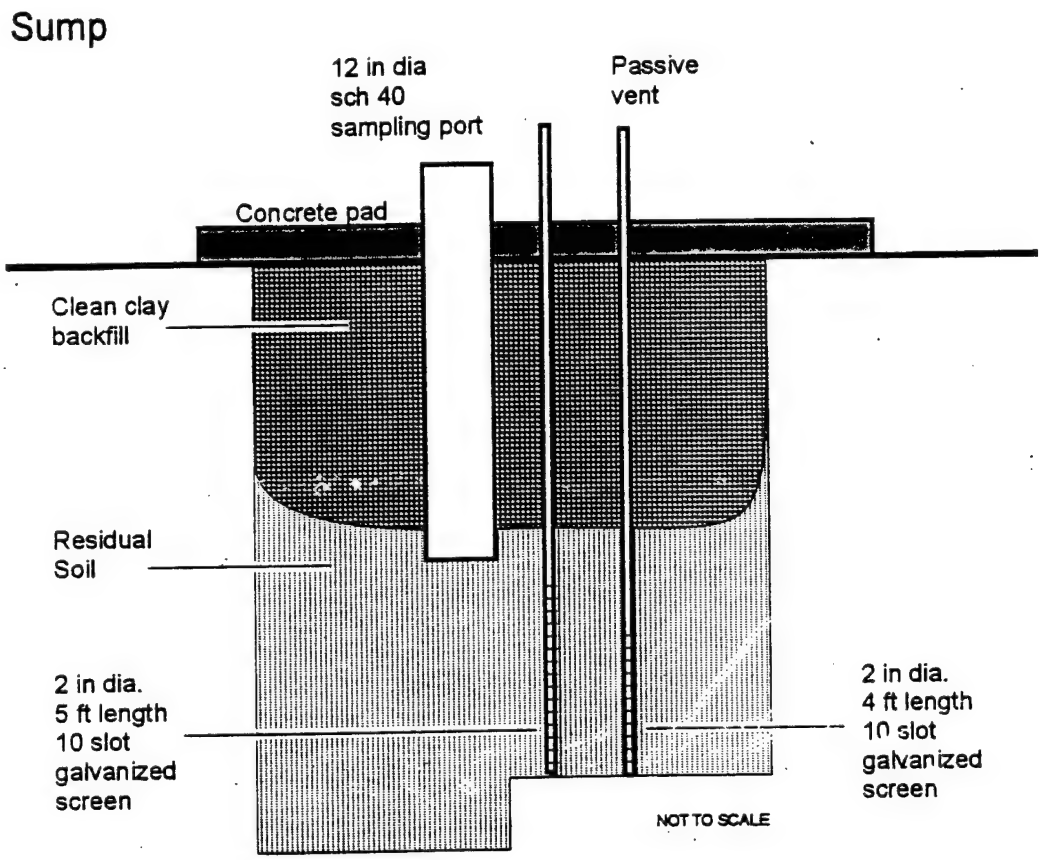

Figure 2. Cross Section of the Sump Area Showing Construction Details of Installations

The sampling port in the sump is constructed similarly to that in Tank 3144 and sits atop the fill materials at approximately 5 feet below the top of the sump walls. The port extends upward through the concrete pad. A 5-foot section of 10-slot screen was attached to the bottom of the existing well point to replace the 10-foot screen. Both well points extend above the concrete pad.

Sampling ports were designed to allow access through the concrete pad over the monolith for final sampling and analysis. Before initiating SVE, Tank 3144 and the Sump Area were drained. This water was removed using the liquid ring pump system described in Section IIB3a. The water was stored in a mobile storage tank. Dewatering was completed on the remainder of the uncontaminated tanks; however, because tanks have recovered some water, groundwater recharge routes must still exist for these tanks. All tank pits were filled with soil in preparation for installation of the concrete pad.

Tank closure operations attempted to seal the tanks and pump pits to isolate them as a source of surface water recharge; however, Tank 3144 slowly recharged with water after the concrete pad was emplaced. The tank may have subsurface leaks that could not be sealed by the concrete pad. Therefore, as mentioned previously, the vent wells in Tank 3144 and the Sump Area were incorporated into the bioslurper manifold so that dewatering and extraction could occur simultaneously.

3. Bioslurper and Shallow Bioventing System

a. Well Installations. Four types of wells were installed at the site: (1) bioslurper wells, (2) groundwater monitoring wells (3) soil gas monitoring points, and (4) shallow vent wells. All wells were drilled by a subcontractor according to the requirements in the Statement of Work. The final number of installations utilized are as follows:

- 20 bioslurper wells
- 8 groundwater monitoring wells
- 8 six-level soil gas monitoring points
- 19 shallow vent wells.

Figure 3 shows the locations of all bioslurper wells, groundwater monitoring wells, soil gas monitoring points, and shallow vent wells. The four types of well installations are discussed individually in Sections 4.2.3.1.1 through 4.2.3.1.4.

(1) Bioslurper Wells. Drilling of 20 bioslurper wells began on 18 July 1994. All 20 wells were completed by 9 September 1994. Wells were labeled 1-098 through 1-124 in accordance with Tinker AFB's labeling scheme. Figure 4 illustrates typical construction details of a bioslurper well. Table 2 lists the screened intervals for these wells.

The wells were drilled using 8-inch outside-diameter (OD) hollow-stem augers to a total depth of 38 feet below ground surface. All wells were completed with 4-inch-diameter, schedule 80 PVC, flush-jointed screen, and casing. The bottoms of the screens were set at the top of the confining layer (shale) between 36 feet and 38 feet. All screens are 20 feet in length and have a slot width of 0.010 inch (10-slot screen). A centralizer was attached to the casing 5 feet above the top of the screen. The casing was cut at 1.0 feet above ground surface. The sand-filter pack consists of 20-40 mesh silica sand from the bottom of the screened interval to 2 feet above the top of the screen; 2 feet of bentonite was added above the top of the sand pack and hydrated to form a seal. Granular bentonite was used to fill the remaining annular space to 2 feet below ground surface.

A 3-foot by 3-foot concrete surface pad was poured that extends down to the top of the granular bentonite to complete the well. The surface pad was sloped away from the casing to provide drainage away from the well. An aluminum well marker was placed in the cement pad on the north side of the casing. The permanent well numbers are stamped into these markers.

(2) Groundwater Wells. The groundwater monitoring wells were drilled and completed by 9 September 1994. Groundwater monitoring wells were labeled SWT-GW-1 through SWT-GW-8. Figure 5 shows a schematic diagram of a typical groundwater monitoring well. Table 2 lists the screened intervals for these wells.

The wells were drilled using 6-inch-OD hollow-stem augers to a total depth of 38 feet below ground surface. All wells were completed with 2-inch, schedule 40 PVC, flush-jointed screen and casing. The bottoms of the screens were set at the top of the confining layer (shale) between 36 feet and 38 feet. All screens are 2 feet in length and have a slot width of 0.010 inch (10-slot screen). Centralizers were attached to the casing at both 5 feet above the top of the screened interval and at 20 feet below ground surface. The casing was cut 1.0 feet above ground surface. The sand-filter pack consists of 20-40 mesh silica sand placed from the bottom of the screen to 2 feet above the top of the

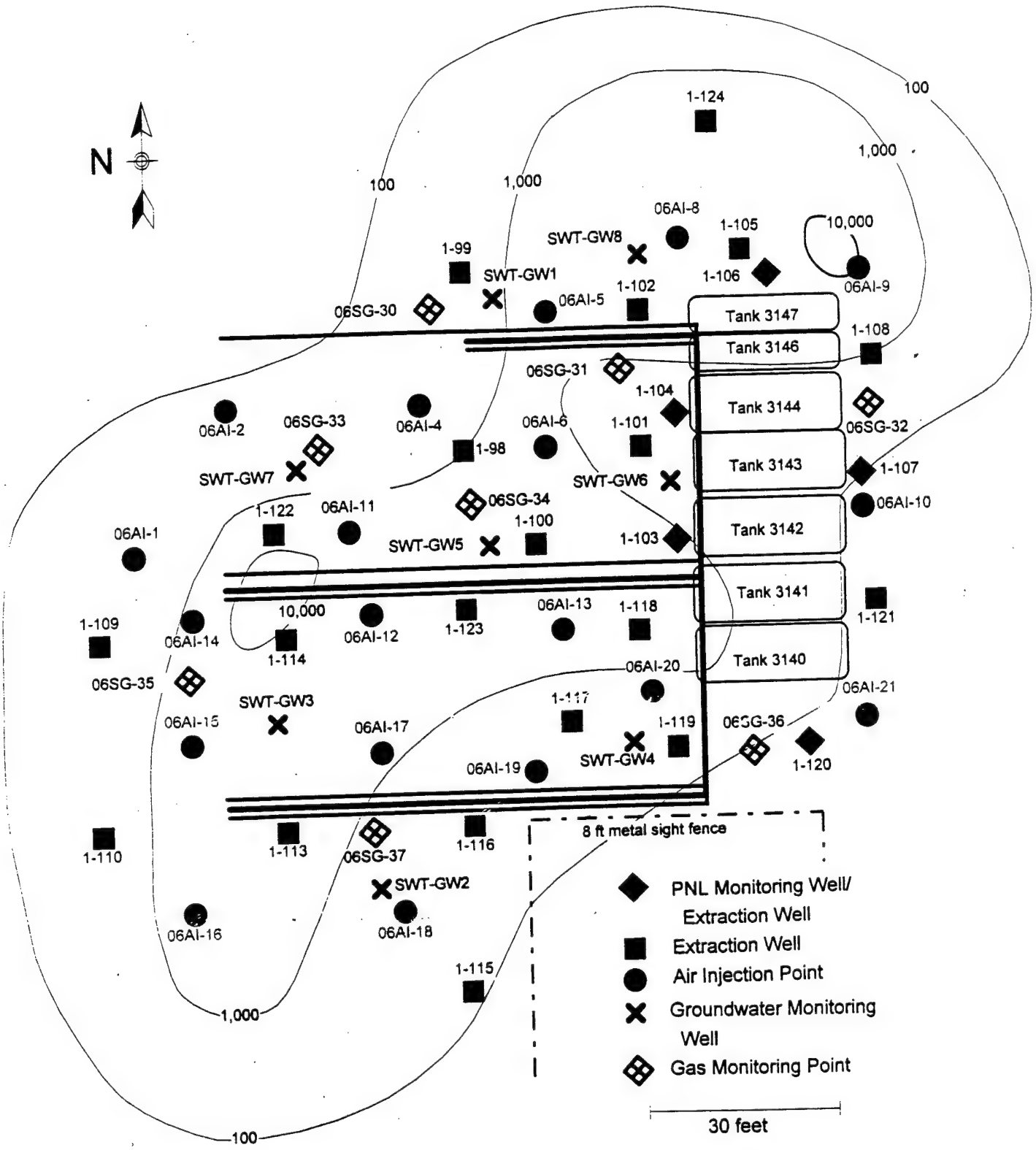

Figure 3. **Schematic Diagram Showing Locations of Bioslurper Wells, Groundwater Monitoring Wells, Soil Gas Monitoring Points, and Shallow Vent Wells at the SWT Site, Tinker AFB, OK**

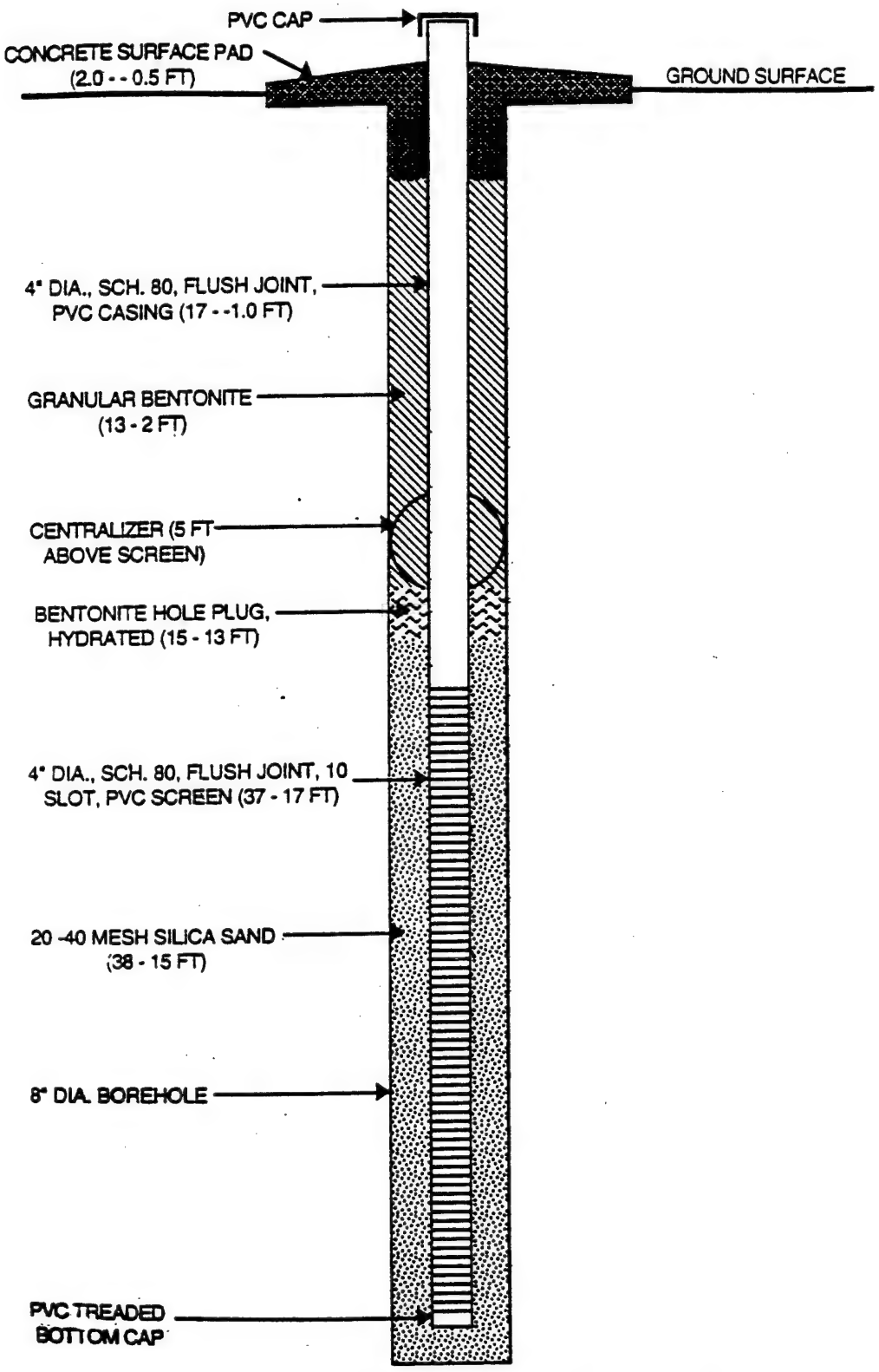

Figure 4. Schematic Diagram of a Typical Bioslurper Well

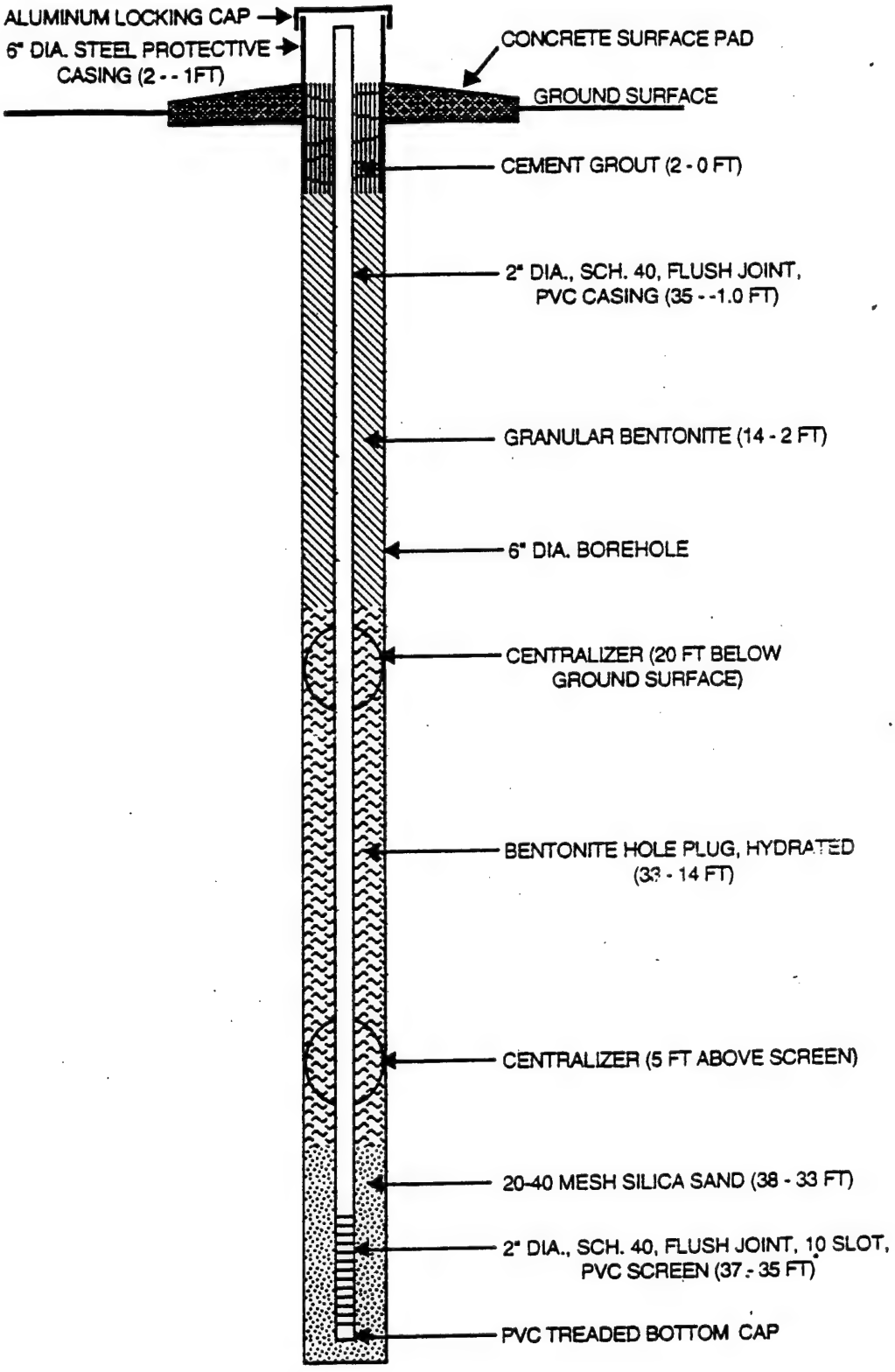

Figure 5. Schematic Diagram of a Typical Groundwater Monitoring Well

Table 2. Installed Bioslurper and Groundwater Well Identification, Screened Intervals, and Depth to Groundwater and Free Product

Well ID	Screened Interval (ft)[1]	Depth to Product (ft)[2]	Depth to Water (ft)[2]	Product Thickness (ft)
Bioslurper Wells (4-inch diameter)				
1-098	17.0 to 37.0	NA	20.51	ND
1-099	17.0 to 37.0	NA	20.19	ND
1-100	17.0 to 37.0	NA	20.79	ND
1-101	17.2 to 37.2	20.28	20.36	0.08
1-102	16.7 to 36.7	20.76	20.82	0.06
1-105	16.0 to 36.0	NA	20.20	ND
1-108	17.0 to 37.0	NA	18.15	ND
1-109	17.0 to 37.0	NA	19.92	ND
1-110	17.0 to 37.0	NA	19.87	ND
1-113	18.0 to 38.0	20.56	20.64	0.08
1-114	17.5 to 37.5	20.62	21.13	0.51
1-115	16.0 to 36.0	NA	20.10	ND
1-116	16.5 to 36.5	20.04	20.23	0.19
1-117	17.0 to 37.0	20.78	20.88	0.10
1-118	17.0 to 37.0	NA	20.38	ND
1-119	16.5 to 36.5	20.43	20.93	0.50
1-121	17.0 to 37.0	NA	18.50	ND
1-122	18.0 to 38.0	NA	20.33	ND
1-123	17.0 to 37.0	NA	20.76	ND
1-124	16.3 to 36.3	Trace	19.92	Trace
Groundwater Monitoring Wells (2-inch diameter)				
SWT-GW-1	35.0 to 37.0	NA	20.41	ND
SWT-GW-2	35.0 to 37.0	20.35	20.38	0.03
SWT-GW-3	35.0 to 37.0	20.59	20.61	0.02
SWT-GW-4	32.0 to 34.0	NA	20.71	ND
SWT-GW-5	35.0 to 37.0	NA	20.79	ND
SWT-GW-6	35.5 to 37.5	NA	20.40	ND
SWT-GW-7	35.0 to 37.0	NA	20.49	ND
SWT-GW-8	34.5 to 36.5	NA	20.35	ND

ND = none detected; NA = not applicable; [1] Screened intervals were measured from ground surface. [2] Depth to product and depth to water were measured on 9 September 1994 from the top of the casing.

screen. Bentonite was placed from the top of the screen to approximately 14 feet below ground surface. The remaining annular space was filled with granular bentonite to a depth of 2 feet below ground surface. A 6-inch-diameter steel protective casing was placed into the borehole from 2 feet below ground surface to 1 foot above ground surface. Cement grout was poured in the annular space between the 2-inch and 6-inch casing from the top of the granular bentonite to ground surface.

A 3-foot by 3-foot concrete surface pad was poured around the 6-inch-diameter protective casing. The surface pad was sloped away from the protective casing to provide better drainage. An aluminum well marker was placed in the concrete pad on the north side of the casing. The well numbers are stamped into these markers.

(3) Soil Gas Monitoring Points. Soil gas monitoring points were installed to allow the collection of pressure, temperature, and soil gas measurements during the soil gas permeability tests, the in situ respiration tests, and the long-term bioventing. Figure 6 shows a schematic diagram of a typical soil gas monitoring point construction. Soil gas monitoring points 06SG-30 through 06SG-37.

Eight boreholes for soil gas monitoring points were completed by 9 September 1994. The boreholes were drilled using 8-inch-OD hollow-stem augers to a total depth of 38 feet below ground surface. The multilevel monitoring points were then installed in the boreholes. The monitoring points consisted of six screened levels (six individual 1/4-inch-diameter nylon tubes, each terminating with 6-inch-long, 1-inch-diameter plastic screen filled with coarse gravel). To facilitate installation, all six screened intervals were attached to a 3/4-inch-diameter, 36-feet-long PVC pipe capped at both ends. The screens were placed at the following intervals: 4.5 to 5.0 feet, 10.5 to 11.0 feet, 16.5 to 17.0 feet, 23.5 to 24.0 feet, 29.5 to 30.0 feet, and 35.5 to 36.0 feet. Approximately 2.5 feet of 20-40 mesh silica sand was placed around each screened interval. Each screened interval was separated by approximately 3.5 feet of hydrated bentonite to seal each interval.

A 3-foot by 3-foot concrete surface pad was poured which extends down to the top of the bentonite to complete the monitoring point. A 12-inch-diameter well box was placed in the center of the pad. A 3/4-inch-diameter pipe was installed to drain liquid from inside the well box. Two 2-inch-diameter PVC access pipes were placed under the pad to allow access into the well box from the north and south. The surface pad was sloped away from the flush-mounted well box to provide better drainage. An aluminum well marker was placed in the pad on the north side of the well box. The permanent identification numbers are stamped into these markers. Metal identification tags were attached to each of the color-coded sampling tubes inside the well box.

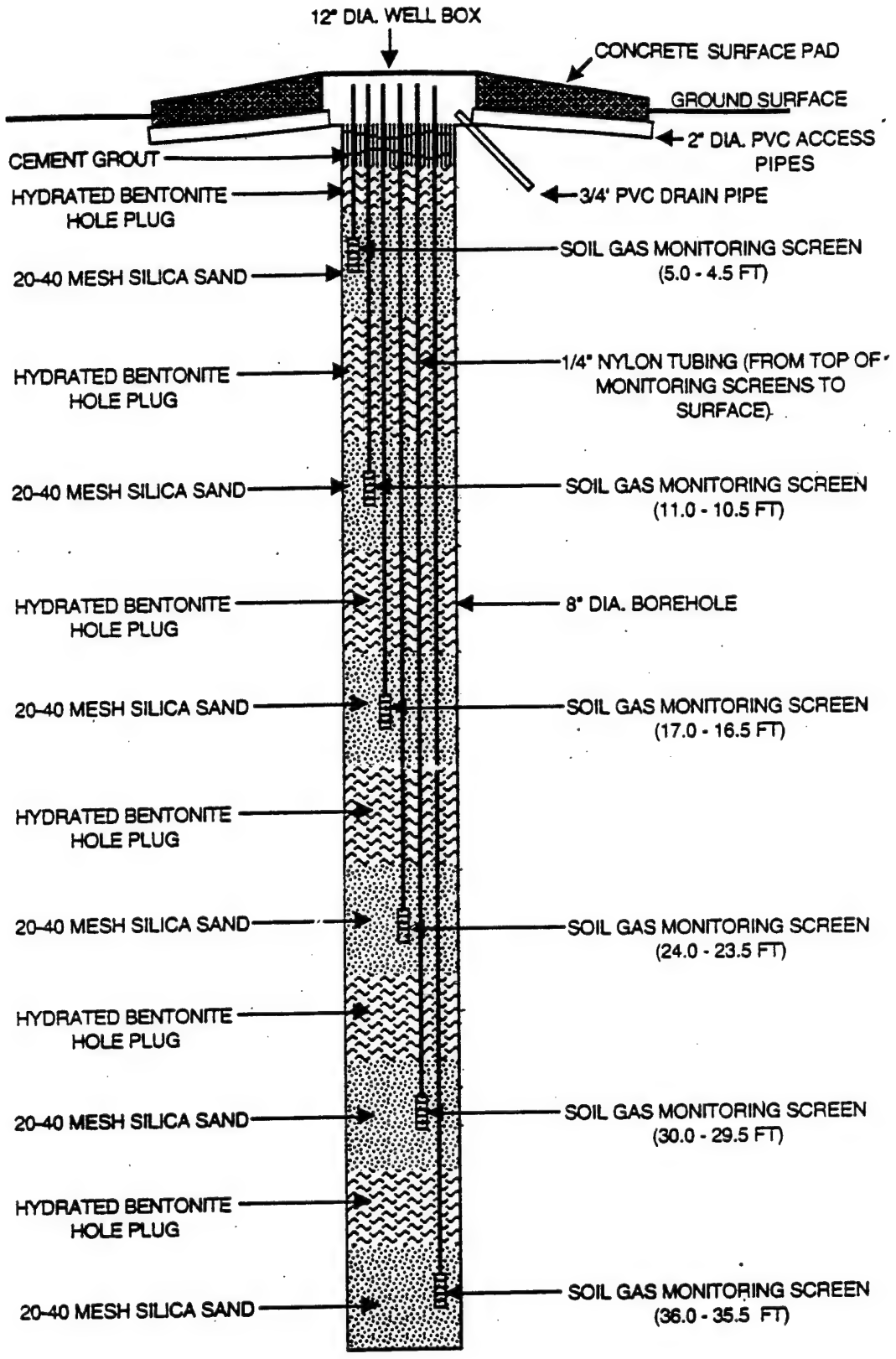

Figure 6. Schematic Diagram of a Typical Soil Gas Monitoring Point

Gypsum blocks were installed in the same borehole, but at different depths than the monitoring points, to monitor soil moisture content. However, due to the extended idle period between project contracts, the gypsum blocks apparently decayed beyond their useful life and had to be abandoned prior to the start of remediation operations.

(4) Shallow Vent Wells. Initially, 21 air injection points were driven to a depth of 10 foot (toward the bottom of the clay layer). Each air injection point was installed by driving a sacrificial drive point attached to the bottom of a temporary probe rod. All air injection points were abandoned in the initial startup of the system. Attempts to push air through these points were unsuccessful; no flow could be achieved in many of the air injection points. G2 International, the company that originally installed the air injection points, attempted to install an additional point by coring instead of driving; however, no flow could be achieved in that point either. The plugged air injection points were pressurized twice up to a pressure of 350 psi in an attempt to open passages or unplug clogged points; however, no flow could be achieved.

To overcome this problem, three types of well configurations were tested to replace the air injection points. The first well tested was a single soil gas monitoring point constructed as described in Section IIB3a(3). The screened interval was placed at 7.5 to 8.0 feet. This monitoring point was labeled 06AI-6, replacing the air injection point originally installed at this location. The remaining 18 shallow vent wells consisted of 2-foot-long, 2-inch-diameter PVC 10-slot screen. The screen was connected either to 1/4-inch-diameter stainless steel tubing or 2-inch-diameter PVC riser to ground surface. The bottom of the screen was placed at a depth of 8 feet. A sand pack was installed in the annular space corresponding to the screened area and grout was installed from the sand pack to ground surface. These wells were labeled 06AI-1 through 06AI-21, with numbers 06AI-3 and 06AI-7 not used, because these numbers were associated with original air injection points that could not be replaced. Vent well 06AI-9 was damaged during the remediation process and was not in use by June 1996.

b. Bioslurper System Components. The bioslurper serves several functions: it removes free product, dewaters the aquifer, and biovents the unsaturated zone. Figure 7 shows an overview of the bioslurper system with the bioslurper wells, the system manifold, and components of the bioslurper. Figure 8 shows the details of the bioslurper system including the surge tank, liquid ring pump, oil/water separator, and temporary holding tank.

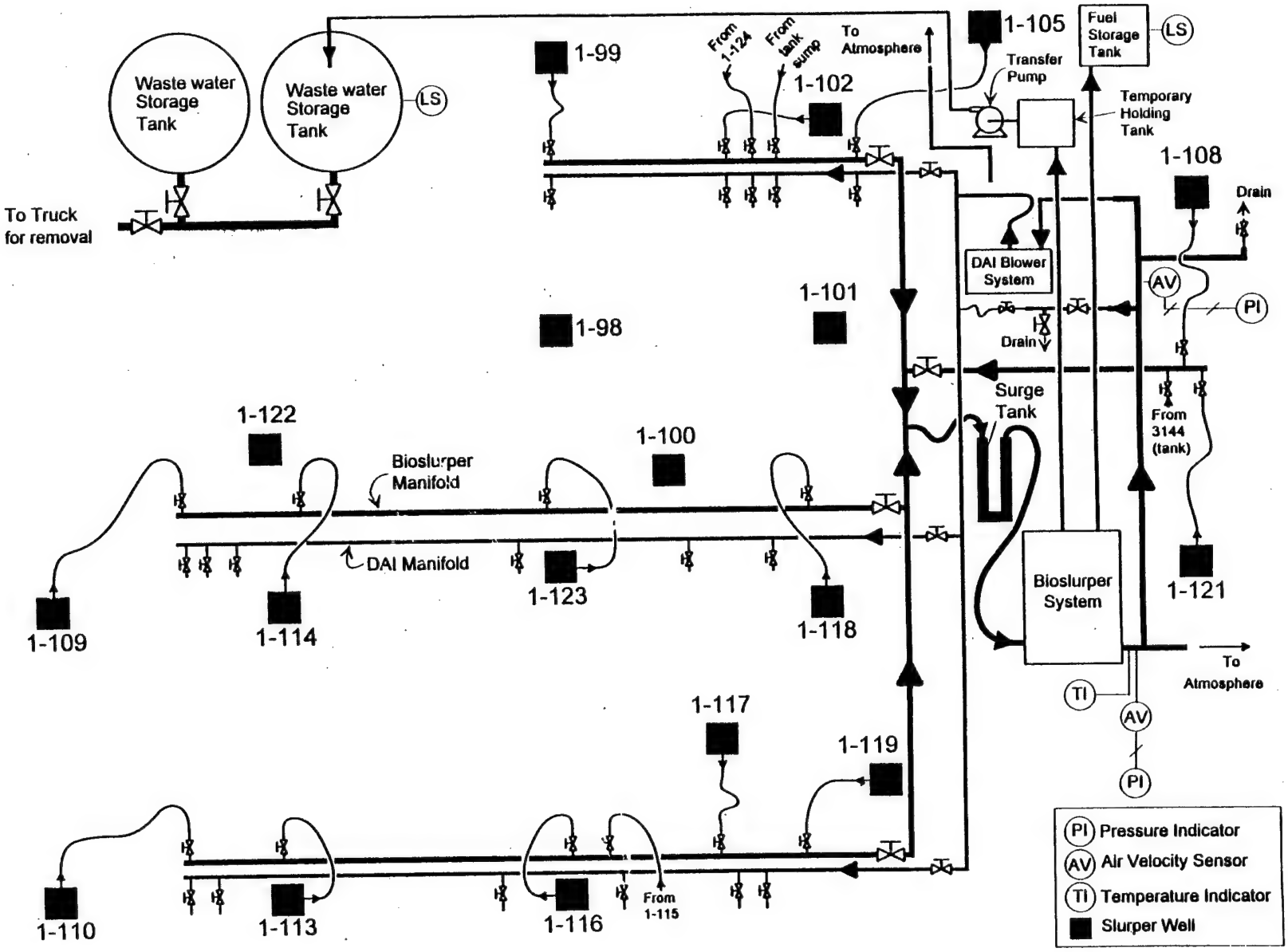

Figure 7. **Overview of the Bioslurper System Showing Bioslurper Wells and the System Manifold**

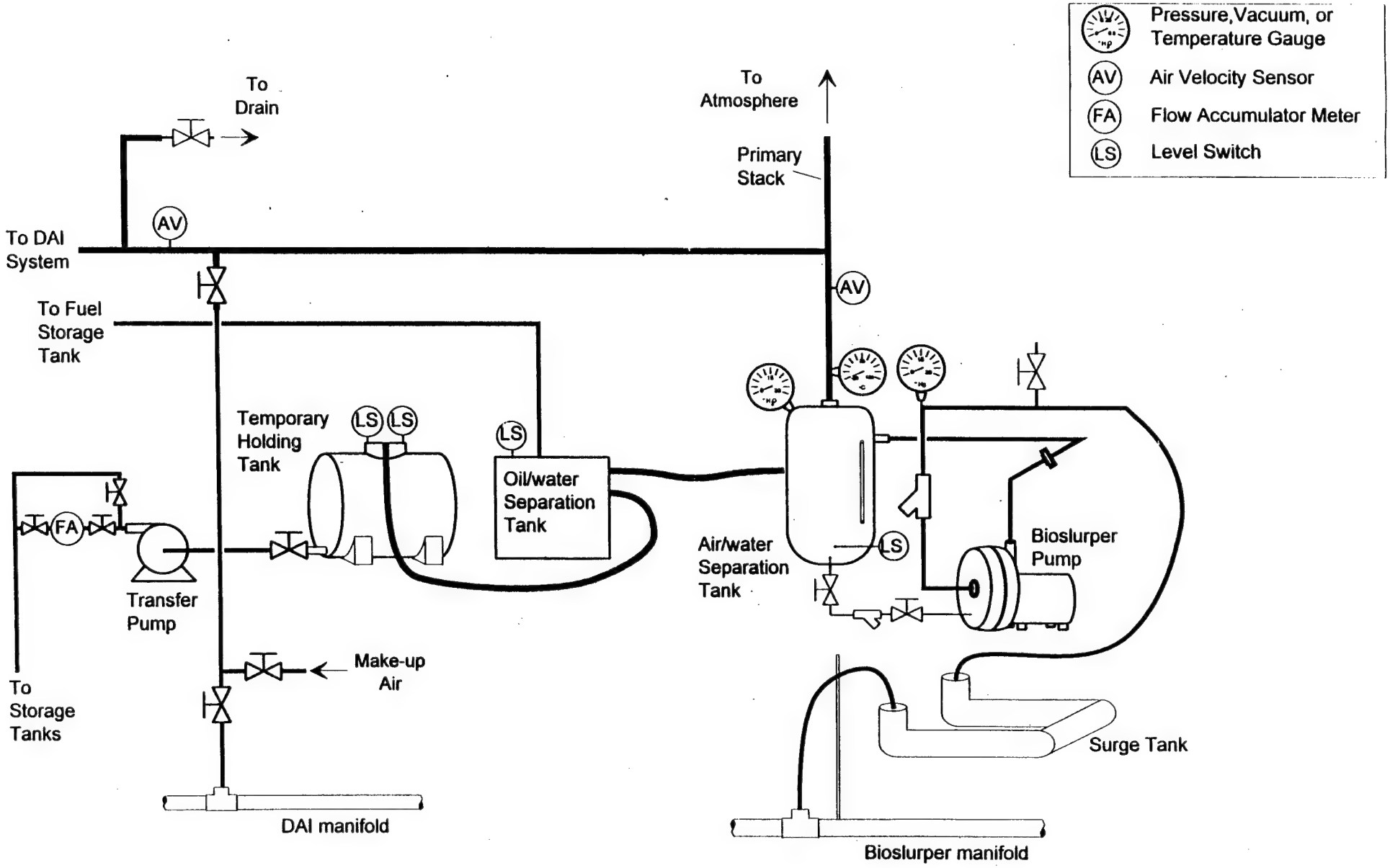

Figure 8. Schematic Diagram of the Bioslurper System Components

The bioslurper system consists of an Atlantic Fluidics 10-hp liquid ring pump to extract groundwater, free product, and soil gas. A 90-gallon-capacity oil/water separator capable of handling 20 gallons per minute (gpm) was installed to separate fuels from groundwater. A Gast 5-hp regenerative blower is plumbed to the off-gas from the liquid ring pump for optional reinjection of off-gases. Cumulative volume of extracted groundwater is quantified with a Fill-Rite liquid flowmeter. Off-gas is measured periodically with an in-line pitot tube.

Recovered water was stored on site in two 6,200-gallon storage tanks and subsequently transported by Brown and Root to Tinker AFB's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) treatment plant for disposal. Soil gas was discharged to the atmosphere after Tinker AFB submitted a request for analysis of permitting requirements through the Tinker AFB Environmental Compliance Division. Tinker AFB gave written permission to discharge while they pursued the applicability of any required permits. In the future, soil gas TPH discharges may require treatment to meet Oklahoma state regulations. This issue is discussed further in Section IV.

If reinjection of off-gases is desired, the upper portion of each bioslurper tube is fitted with a T which is capped when the well is not used for reinjection. This configuration allows for maximum flexibility in system operation in that any bioslurper well can be used for removing fluid or reinjecting air or off-gas. To switch from the bioslurping configuration to the reinjection configuration, the cap on the T is removed and the well is connected by camlocks to the reinjection manifold system. The reinjection configuration was not used on any wells during the 8-month timeframe reported here.

c. Shallow Bioventing System Components. The shallow bioventing system is the second component of the bioremediation effort. Figure 9 shows the shallow bioventing system manifold and vent wells. Air is injected with a Gast rotary vane model 6066 5-hp blower. Figure 10 shows the three wellhead types and the connection from the shallow vent wells to the manifold. The three wellhead types are all functionally equivalent. More detailed information can be found in the O&M Manual.

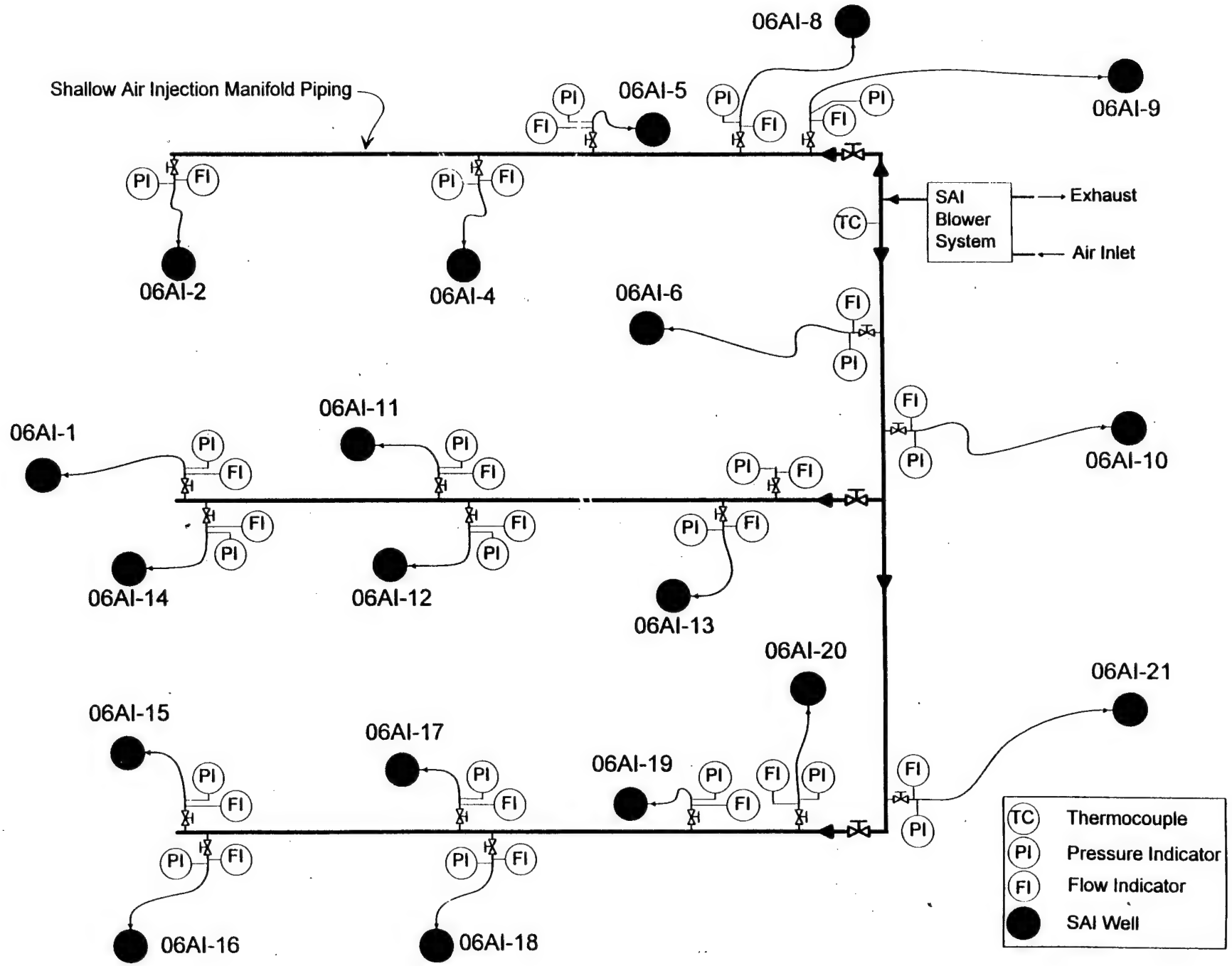

Figure 9. Shallow Bioventing System Manifold and Vent Wells

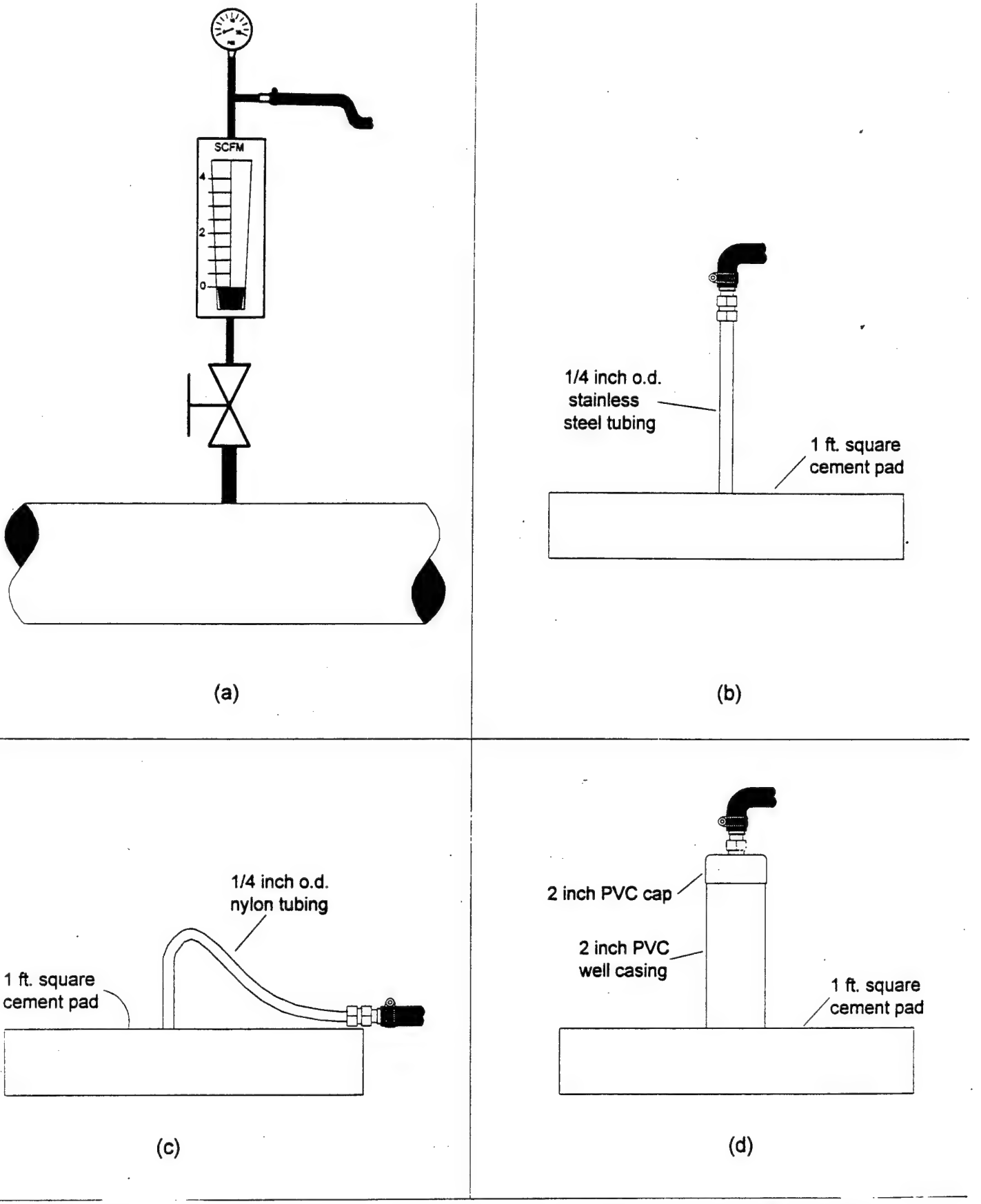

Figure 10. **Three Wellhead Types and the Connection From the Shallow Vent Wells to the Air Injection Manifold**

SECTION III

METHODS FOR SYSTEM OPERATION AND MONITORING, AND FIELD TREATABILITY TESTS

A. BIOREMEDIATION SYSTEM OPERATION

1. Operations Strategy

The overall operational strategy for the SWT Site is to lower the water table and to augment the delivery of oxygen to the contaminated portions of the aquifer. Groundwater levels at the site need to be kept at approximately 32 to 35 feet BGL to aerate all contaminated soil. Contaminated soils are aerated both by the bioslurper system and the shallow bioventing system.

In situ soil gas oxygen concentration is monitored to determine whether a certain area or region of the site is receiving adequate aeration. Oxygen concentrations should be above 5 percent for acceptable biodegradation to occur (Leeson and Hinchee, 1995).

2. BIOSLURPER SYSTEM OPERATION

a. Site Dewatering. The demonstration dewatering goal was chosen based on contaminant distribution data taken during the well installation. The data indicate that little contamination exists in the aquifer below 35 feet BGL (1,239 feet above mean sea level [MSL]). Therefore, a target dewatering level of 32 feet BGL throughout the 1,000-ppm TPH contour was chosen to reduce the potential for further vertical spreading of the already extensive smear zone.

A short-term pump test was conducted during the initial characterization phase of the project to gather the hydrologic data needed to specify the groundwater extraction rate. These data were used to model the dewatering process to provide more reliable estimates of dewatering rates. Dewatering was simulated using the U.S. Geological Survey's modular finite-difference groundwater flow model (MODFLOW). These simulations were based on generalized input parameters only. The detailed calibration and validation procedures required for more rigorous modeling exercises were not employed. A limitation of the model is the inability of the MODFLOW code to simulate the effects of groundwater recharging on the simulated aquifer following initial dewatering.

The surface layer was simulated as an unconfined, homogeneous, isotropic sandstone aquifer. The model covered an area 550 feet long, 550 feet wide, and 37 feet deep. This area was

divided into model cells that were 10 feet on each lateral side. Thus, the model consisted of 55 rows, 55 columns, and 1 layer. The topographic elevation at the site is approximately 1,274 feet above MSL and the lower confining shale is present at about 1,237 feet above MSL. A representative hydraulic conductivity value of 1 feet/day and a specific yield value of 0.2 were used. A recharge rate equivalent to 1 inch/year was specified. Based on the observations for water-level variations in this area, the total hydraulic gradient across the site is approximately 3 feet with an east-to-west slope. This gradient was simulated by specifying an equivalent inflow along the eastern edge and outflow along the western edge of the model. A steady-state simulation was performed to ensure that this model setup realistically mimics the flow conditions at the site.

Pumping from the aquifer was simulated using all 19 wells with maximum capacity of 2 gpm. The simulated locations of these wells were the same as the locations of actual extraction wells at the site. Pumping rates of 0.5, 1, and 2 gpm were simulated. Pumping durations ranged from 10 days to 2 months. In general, higher pumping rates resulted in steep cones of depression and rapid dewatering around individual wells with saturated areas between the wells. With slower withdrawals (0.5 gpm per well), some wells began going dry after about a month. At that time, the model still predicts some saturated areas between the wells. These saturated areas are predicted to become dry with continued pumping.

The map of predicted water level after 35 days of pumping at 0.5 gpm per well (Figure 11) shows a large dry region in the center. However, the corners of the pumping area still contain some volume of water. A faster pumping rate (1 gpm per well) results in a faster initial desaturation in most wells, but time is still required to bring the entire site down to acceptable levels.

Overall, the simulation showed that a pumping rate between 0.5 gpm and 1.0 gpm per well will dewater the center of the study area in about 2 months. The modeling also indicated that a continuous water removal rate of approximately 600 gph would be required to completely dewater (to 32 feet BGL) the contaminated region within the 1,000-ppm contour. At 600 gph, if water could be evenly withdrawn from all 19 bioslurper wells, complete dewatering was calculated to require approximately 60 days. It should be noted that complete site dewatering is not required to remediate the site. Smaller portions can be dewatered and remediated, and then other wells can be activated to dewater other site regions.

b. Operational Parameters. During operations, the perched groundwater was drawn down to dewater the hydrocarbon smear zone. Bioslurper tubes were set at 32 feet BGL to withdraw groundwater from the formation. These tubes rapidly dewatered the extraction wells and began to

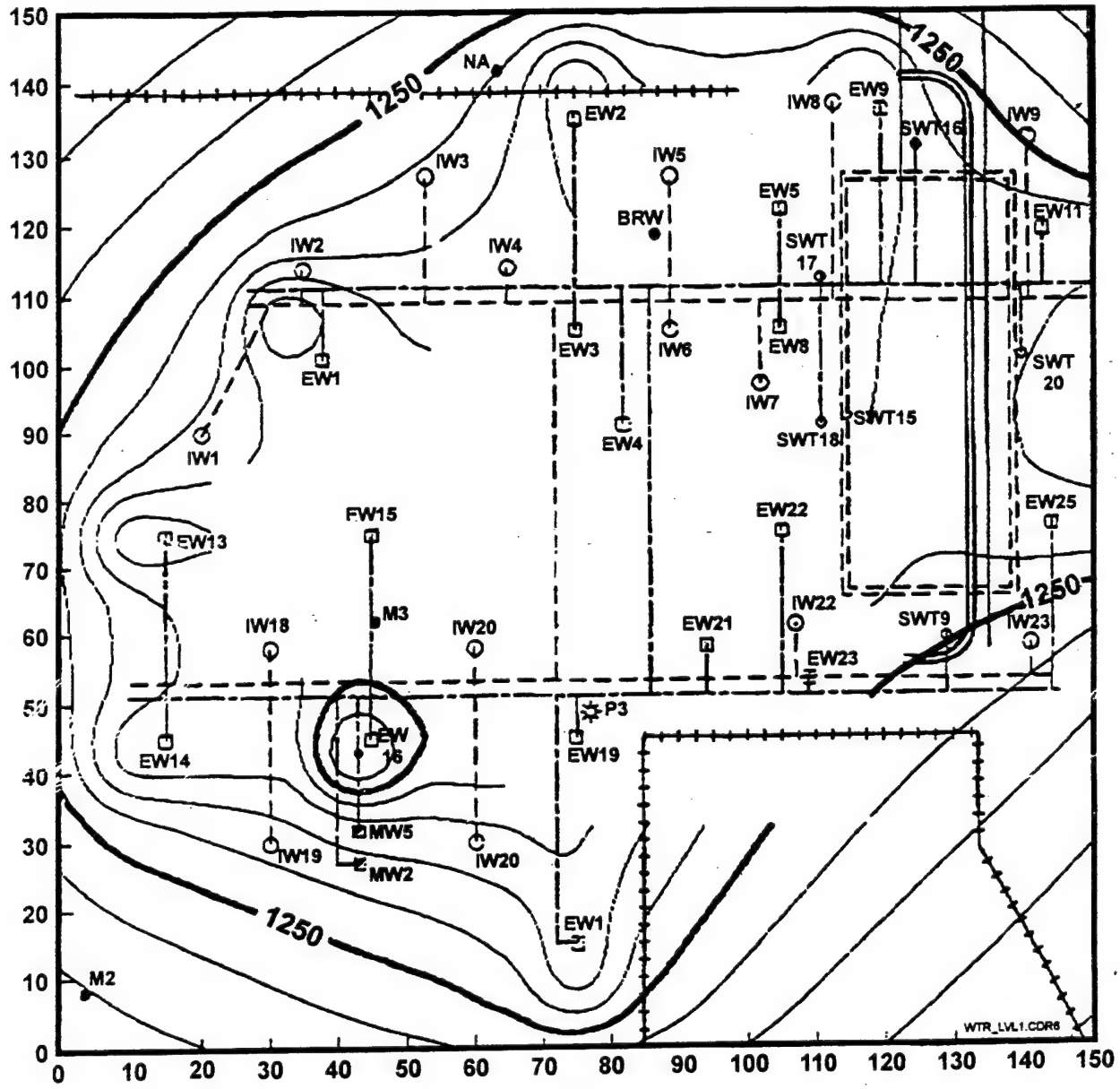

Figure 11. Map of Predicted Water Level After 35 Days of Pumping at 0.5 gpm/Well

withdraw soil gas for bioventing. The overall groundwater extraction rate ranged from 400 to 600 gph, with a peak flow rate of 1,000 gph. Groundwater extraction data is provided in Appendix B.

Soil gas extraction rates were dependent upon the groundwater extraction rate and therefore varied with time and by bioslurper well. Typically, the soil gas extraction rate ranged from 20 to 50 cfm. The operations log for the bioslurper system is provided in Appendix C.

3. Shallow Bioventing System

The shallow bioventing system was initiated in October 1995. The flow rate varied over time, because the vent wells were able to accept more flow over time, perhaps as perched water was forced out of the clay formation. The total flow rate ranged from 40 to 80 cfm, with approximately 2 to 4 cfm per vent well.

B. SYSTEM MONITORING

System monitoring was conducted to ensure optimal performance of the bioremediation system. Specific monitoring which was critical to system performance were groundwater-level measurements and soil gas measurements in the off-gas and in situ. In addition, the mass of hydrocarbons recovered in free product, groundwater, and soil gas were monitored.

1. Groundwater-Level Data

To monitor the SWT Site dewatering process, a continuous water-level monitoring network was installed to monitor water-level trends before the bioremediation demonstration and track aquifer dewatering during the demonstration. A Keller series 169 strain gauge pressure transducer was installed in each of the eight groundwater monitoring wells at the site. The pressure response was monitored and recorded using a Campbell Scientific Inc. CR10 data logger. Pressure was monitored at an initial interval of 30 minutes during the predemonstration period, but intervals were increased to 2 hours during most of the demonstration. Pressure readings were compared with manual water-level measurements made with an ORS model oil/water interface probe, to check the calibration of the pressure transducer. Due to technical equipment failure, the signal from the transducer in SWT-GW-5 could not be logged onto the datalogger. Therefore, with the exception of

hand measurements, no automated groundwater-level data were collected for SWT-GW-5. Groundwater-level data can be found in Appendix D.

2. Soil Gas Monitoring

Soil gas monitoring was conducted on the system off-gas and in situ. System off-gas measurements were taken to verify proper operation of the vapor treatment system and to quantify mass of hydrocarbon volatilized and biodegraded. During operations, in situ soil gas oxygen, carbon dioxide, and TPH measurements were taken to monitor the effectiveness of air movement throughout the contaminated formation. Soil gas measurements were used to determine areas of the formation that may not be receiving adequate air flow to maintain maximum hydrocarbon biodegradation rates.

Off-gas measurements were collected five times a week via a sampling port located immediately after the reservoir. Oxygen and carbon dioxide concentrations in the soil gas were measured with a direct-reading GasTechtor Model 32520X CO_2/O_2 detector. Concentrations of TPH were measured with a direct-reading GasTech Trace-Techtor hydrocarbon vapor meter. Each field analytical instrument was calibrated daily with calibration gas standards prior to use. In addition to field measurements, samples also were collected 10 times in evacuated 1-L Summa canisters and sent to Air Toxics Ltd. in Folsom, CA for determination of the BTEX compounds. Laboratory analytical reports are provided in Appendix E. Stack gas data are provided in Appendix F.

In situ soil gas measurements were taken once a week by extracting soil gas from a monitoring point using a 1/2-hp diaphragm pump. The sampling pump system is shown schematically in Figure 12. Soil gas concentrations of oxygen, carbon dioxide, and TPH were measured using the hand-held instruments described in the preceding paragraph. Soil gas data are provided in Appendix G.

3. Measurements of Hydrocarbon Mass Removal

Hydrocarbon mass removal was quantified in extracted groundwater and soil gas, and from biodegradation. No measurable free product was recovered during system operation. Methods for these calculations are provided in the following paragraphs.

Extracted groundwater was analyzed 12 times between 13 February 1996 and 7 June 1996. Samples were analyzed for BTEX and TPH at Alpha Analytical Laboratories in Sparks, NV. Laboratory analytical reports are provided in Appendix E. Using cumulative volume measurements

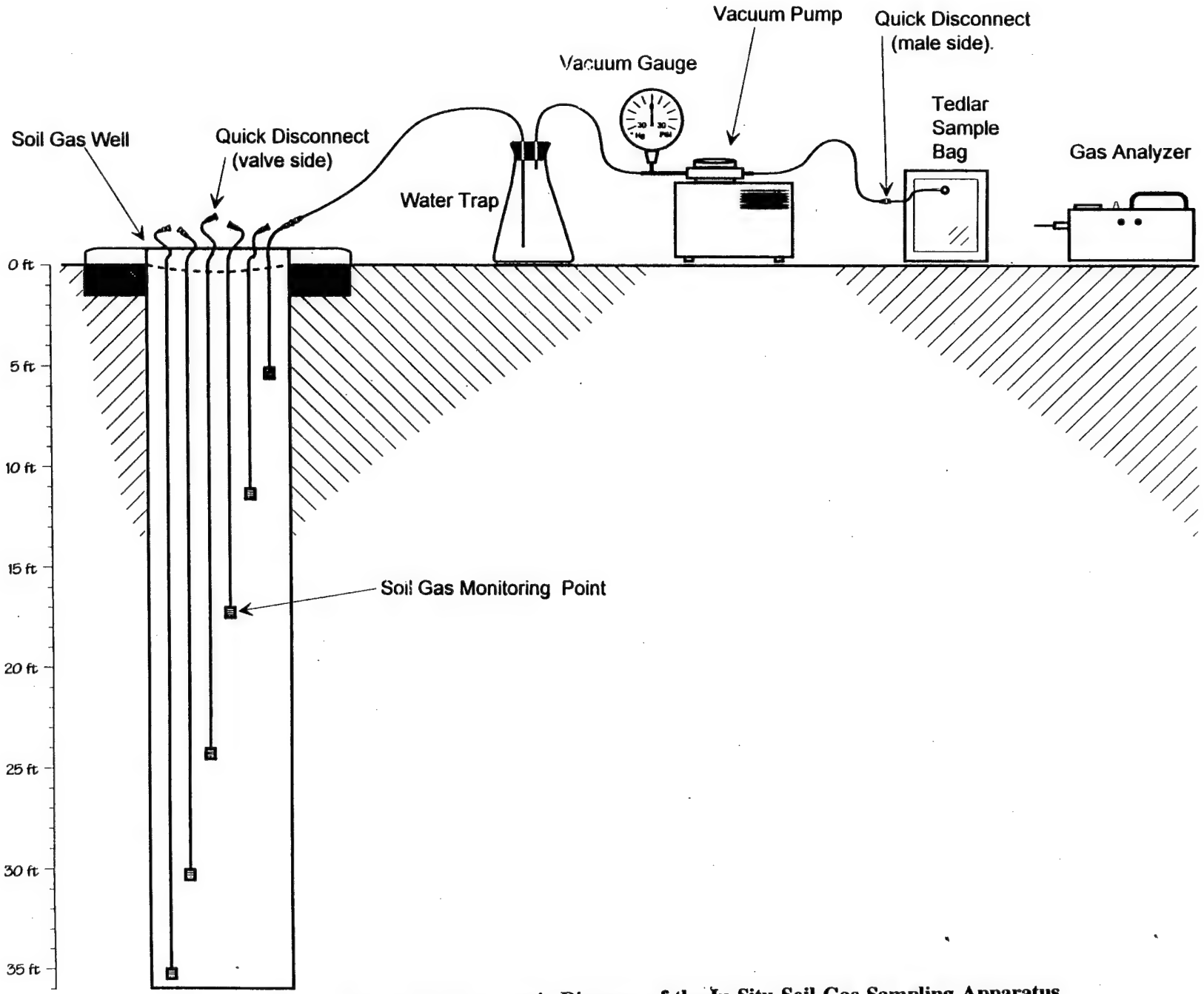

Figure 12. Schematic Diagram of the In Situ Soil Gas Sampling Apparatus

and average TPH concentrations, a total mass removal of TPH in groundwater was calculated.

Mass removal in extracted soil gas was calculated by using average TPH concentrations as measured using field instrumentation and average flow rates. The mass of TPH in the extracted soil gas was calculated by assuming a hexane equivalent mass as follows:

$$HC_{vol} = \frac{C_{V,HC}}{10^6} \times Q \times \rho_{hexane} \times MW_{hexane} \quad (1)$$

where: HC_{vol} = mass of hydrocarbons volatilized (kg/day)

$C_{V,HC}$ = hydrocarbon concentration in extracted off-gas (ppmv)

Q = flow rate (L/day)

ρ_{hexane} = density of hexane (moles/L)

MW_{hexane} = molecular weight of hexane (kg/mole)

The mass of hydrocarbons biodegraded was calculated by assuming a stoichiometry as follows:

$$C_6H_{14} + 9.5O_2 \rightarrow 6CO_2 + 7H_2O \quad (2)$$

The mass of hydrocarbon biodegraded was then calculated using an average oxygen concentration in the extracted off-gas and using the following equation:

$$HC_{bio} = \left(\frac{C_{V,bkgd} - C_{V,O_2}}{100}\right) \times Q \times C \times \rho_{O_2} \times MW_{O_2} \quad (3)$$

where: HC_{bio} = mass of hydrocarbons biodegraded (kg/day)

$C_{V,bkgd}$ = concentration of oxygen in background, uncontaminated area (percent) (assumed to be 20.9 percent)

$C_{V,O2}$ = concentration of oxygen in extracted off-gas (percent)

C	=	mass ratio of hydrocarbon to oxygen degraded based on stoichiometry (1/3.5)
ρ_{O2}	=	density of oxygen (moles/L)
MW_{O2}	=	molecular weight of oxygen (kg/mole)

Data from stack gas measurements of volumetric flow rate and oxygen, carbon dioxide, and TPH concentrations are given in Appendix F.

C. FIELD TESTS

1. In Situ Respiration Testing

Three in situ respiration tests were conducted from October 1995 to June 1996. These tests were conducted at all soil gas monitoring points.

The in situ respiration tests performed during the demonstration were initiated by turning off the liquid ring pump and allowing the site to return to its natural state (i.e., with no air injected in the shallow injection points and no air or water removed from the deep extraction wells). Initial soil gas values for oxygen, carbon dioxide, and TPH were taken prior to turning off the bioslurper and shallow bioventing systems. Soil gas was extracted using the sampling system described in Section 111B1 Typically, soil gas measurements were conducted at 2, 4, 6, and 8 hours and thereafter every 12 hours, depending on the rate of oxygen utilization. When oxygen uptake was rapid, more frequent monitoring was required.

The experiment was terminated when the soil gas oxygen concentration decreased to approximately 2 percent or after 4 to 5 days of sampling. The oxygen utilization rates were then used to determine the biodegradation rates. To calculate the biodegradation rate, a stoichiometric relationship of the oxidation of the hydrocarbon was assumed. Hexane was used as the representative hydrocarbon for the organic contaminant. The stoichiometric relationship is given by Equation 2.

Based on the utilization rates (percent per day), the biodegradation rates in units of mg hexane equivalent per kg of soil per day were computed using the equation below. A soil porosity of 0.3 and a bulk density of 1,440 kg/m^3 were assumed in these calculations.

$$K_\beta = \frac{- K_o A D_o C}{100} \quad (4)$$

where: K_β = biodegradation rate (mg/kg-day)

K_o = oxygen utilization rate (percent per day)

A = volume of air/kg of soil, in this case 300/1,440 = 0.21

D_o = density of oxygen gas (mg/L), assumed to be 1,330 mg/L

C = mass ratio of hydrocarbon to oxygen required for mineralization, assumed to be 1/3.5 from Equation 2.

In situ respiration data is given in Appendix G.

2. Helium Tracer Tests

Two helium tracer tests were conducted as part of the characterization, design, and operation of the demonstration. The first helium tracer test was conducted in October 1995 to determine airflow characteristics of the upper clay layer and to demonstrate the connectivity of the shallow vent wells and the bioslurper wells. The second helium tracer test attempted to determine air movement and connectivity of a soil gas monitoring point to the deep extraction wells and the bioslurper system. This second tracer test was not successful in recovering enough helium at the bioslurper stack to be of practical value for this purpose. Helium tracer test data is provided in Appendix H.

During the first helium tracer test, helium was monitored at all monitoring points throughout the site. The helium tracer study involved injecting air with approximately 5.0 percent helium into the shallow bioventing system manifold for 24 hours. The helium injection was turned off after this time period, and the concentration of helium in the soil gas was monitored over time with a Mark Products helium detector. The helium concentration in the injection air was checked periodically after initiation of injection to ensure that the proper mix was maintained. After helium injection was turned off, air injection continued for the test duration of 95 hours. Soil gas concentrations of oxygen, carbon dioxide, and helium were monitored regularly during the this time period.

SECTION IV

RESULTS AND DISCUSSION FOR SYSTEM OPERATION AND MONITORING, AND FIELD TESTS

A. SYSTEM OPERATION

System operation was conducted as described in Section III. Specific details on groundwater extraction rates and airflow rates for the shallow bioventing system are described in the following sections.

1. Groundwater Extraction Rates

Data for the groundwater extraction volumes are shown in Figure 13. When the liquid ring pump was operating, the groundwater extraction rate was sufficiently high, averaging 575 gph, indicating that the liquid ring pump could withdraw the water flow rates required for site dewatering. However, the overall average groundwater extraction rate, including downtime, after the initial startup period was 216 gph. Because groundwater infiltration to the site elevated the groundwater to its natural level during system downtime, the site was not continuously dewatered throughout the entire demonstration duration. While optimum biodegradation occurs when soils are exposed soils are exposed to oxygen, it may be unreasonable to expect that the entire site be maintained in a completely dewatered state continuously. Operational tests and equipment maintenance will require that the dewatering activities be halted periodically. The system objective is to expose subsurface soils to oxygen as much as is feasible given the testing and maintenance required to track contaminant removal and maintain system components in working order.

2. Shallow Bioventing System

Figure 14 shows volumetric flow rate data for the shallow bioventing system. It can be seen that, upon initial pressurization of the shallow bioventing system, only four vent wells (06AI-4, 8, 11, and 17) responded favorably by accepting more than 1 cfm. After 24 hours of pressurization, these wells continued to accept increasing flow rates at constant pressure. This increase is believed to be the result of forcing water out of nearby fractures creating favorable pathways for air flow. After 40 to 70 hours of pressurization, an additional 9 vent wells (06AI-1, 2, 5, 6, 12, 13, 16, 18, and 20)

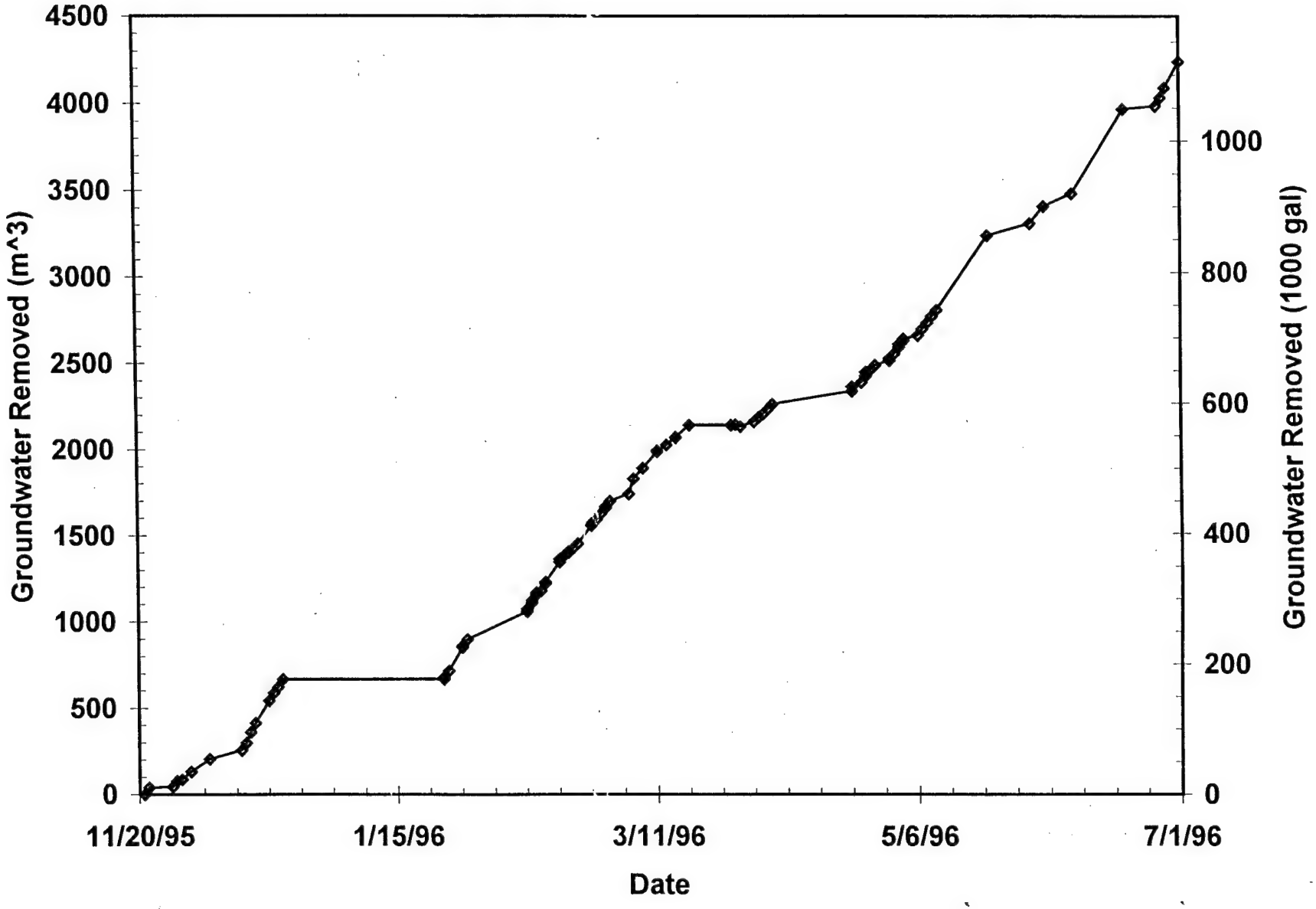

Figure 13. Measured Groundwater Extraction Rates

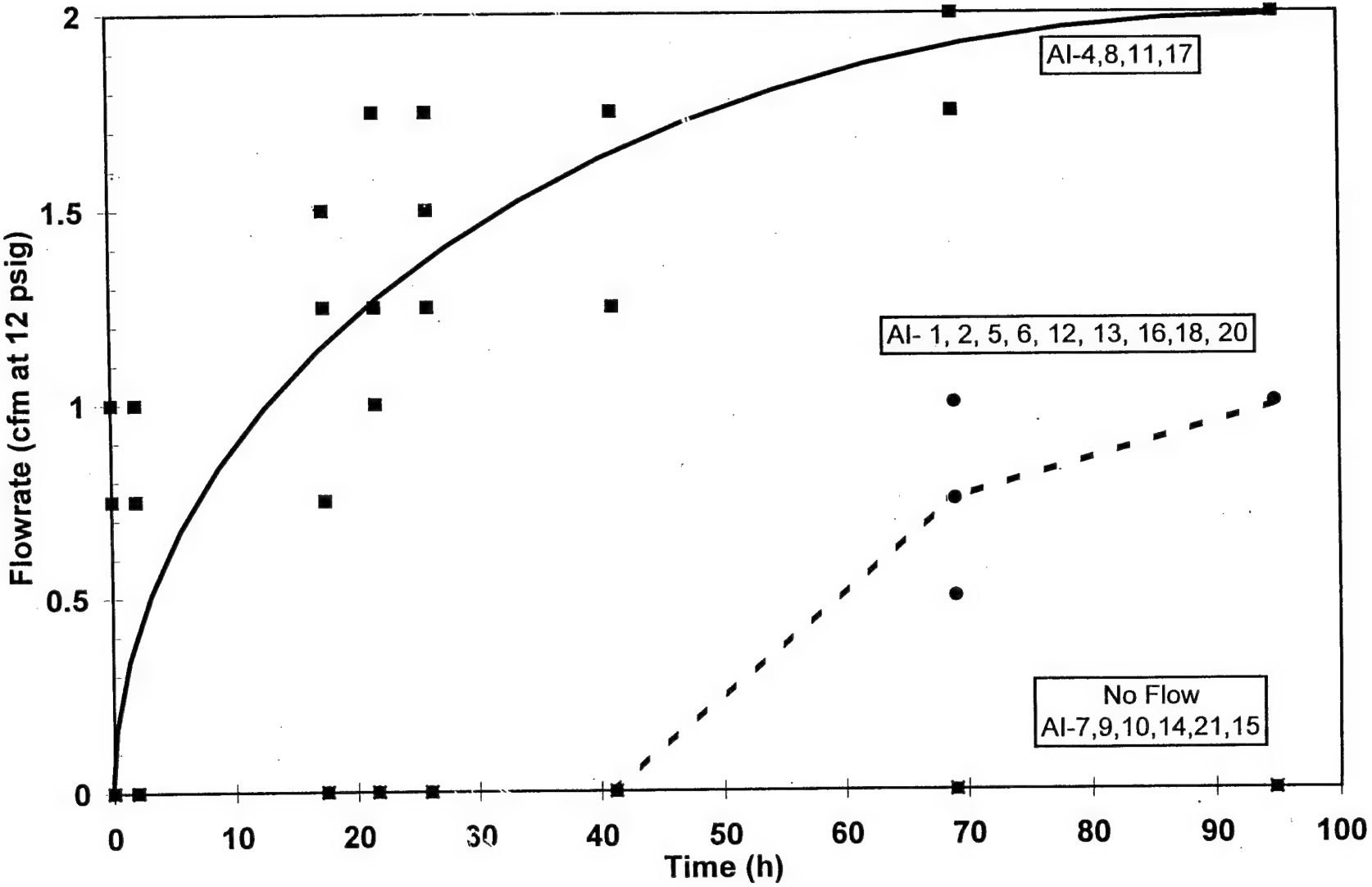

Figure 14. Volumetric Flowrates for the Shallow Bioventing System

began to respond with significant flow rates. By 95 hours, these additional vent wells had all reached an air injection rate of 1 cfm. Only minimal flow was possible into six vent wells (06AI-7, 9, 10, 14, 15, and 21) even after extended periods of air injection. Flow was observed in these wells, but at flow rates below the measurable scale of the in-line flowmeter. Even at these relatively low flow rates, oxygen concentrations in the shallow clay layer typically were above 5 percent. Therefore, the shallow bioventing system was delivering adequate oxygen supply to facilitate biodegradation.

B. SYSTEM MONITORING

1. Groundwater-Level Data

Groundwater-level data for the demonstration are given in Figures 15 through 18. In these figures, it can be seen that the site was not dewatered to the extent that was expected during this 6-month investigation. Figures 19 and 20 show groundwater-level contours for 20 December 1995 and 12 June 1996. During operations, groundwater levels in the actively extracting bioslurper wells were drawn down to 1,242 feet MSL. The contours were developed using this information and data from the groundwater monitoring wells. It can be seen that dewatering patterns closely followed the 1,000-ppm TPH contour. However, the typical groundwater elevation in the contaminated region was 1,247 feet MSL, 5 feet short of the 1,242-ft-MSL goal. Near the operating individual extraction wells, large depressions in the water table were observed.

2. Soil Gas Monitoring

Table 3 gives in situ soil gas measurements taken in May and June 1996. It can be seen that most of the soil gas monitoring points have adequate oxygen flux to supply oxygen for in situ respiration; however, at SG-36 at the 5- and 11-foot depths, the oxygen concentration remained low ($\leq$2 percent O_2) during the May surveys. Based on the low oxygen concentrations obtained on 3 May and again on 10 May, bioslurper well 1-119, near SG-36, was connected to the manifold system on 6 June for groundwater and soil gas extraction. Oxygen concentrations at SG-36 increased at all monitoring levels, while carbon dioxide concentrations decreased at each level. By comparing oxygen concentrations obtained in May and then again in June, it can be seen that selective operation of the deep extraction wells can be used to enhance the efficiency of oxygen delivery for the overall system.

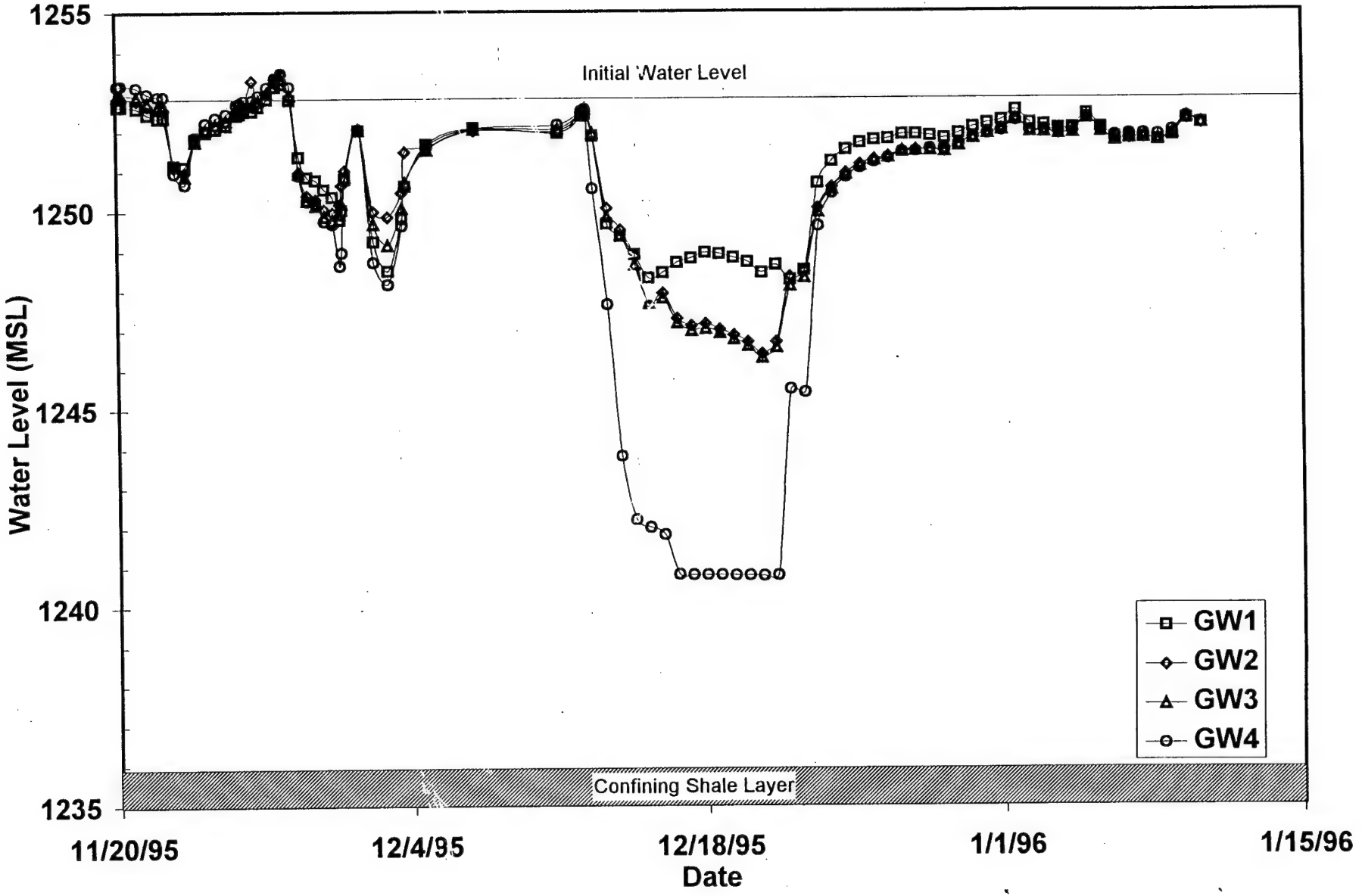

Figure 15. **Groundwater-Level Data for Wells GW1 to GW4 (20 November 1995 through 15 January 1996**

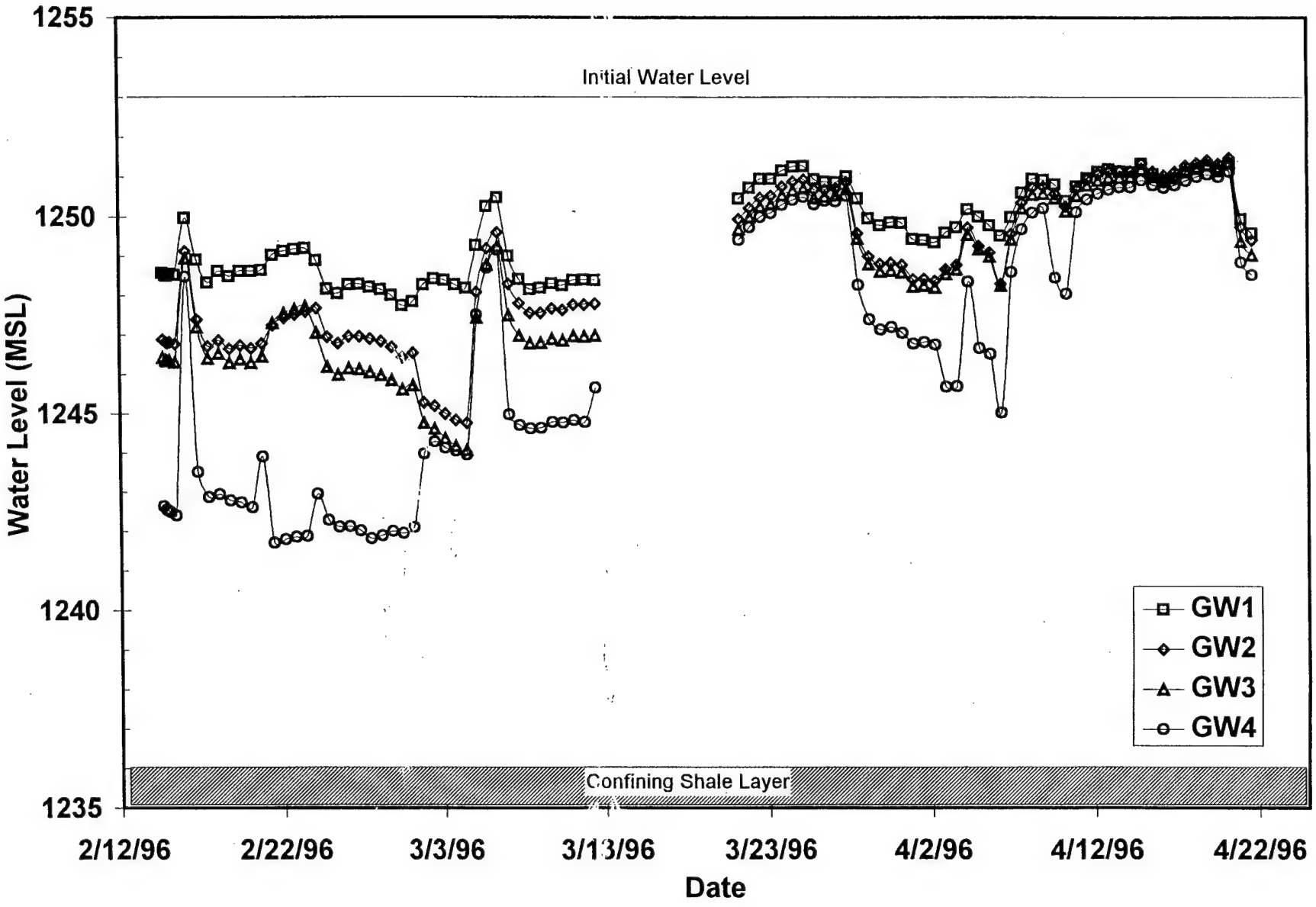

Figure 16. **Groundwater-Level Data for Wells GW1 to GW4 (12 February 1996 through 22 April 1996)**

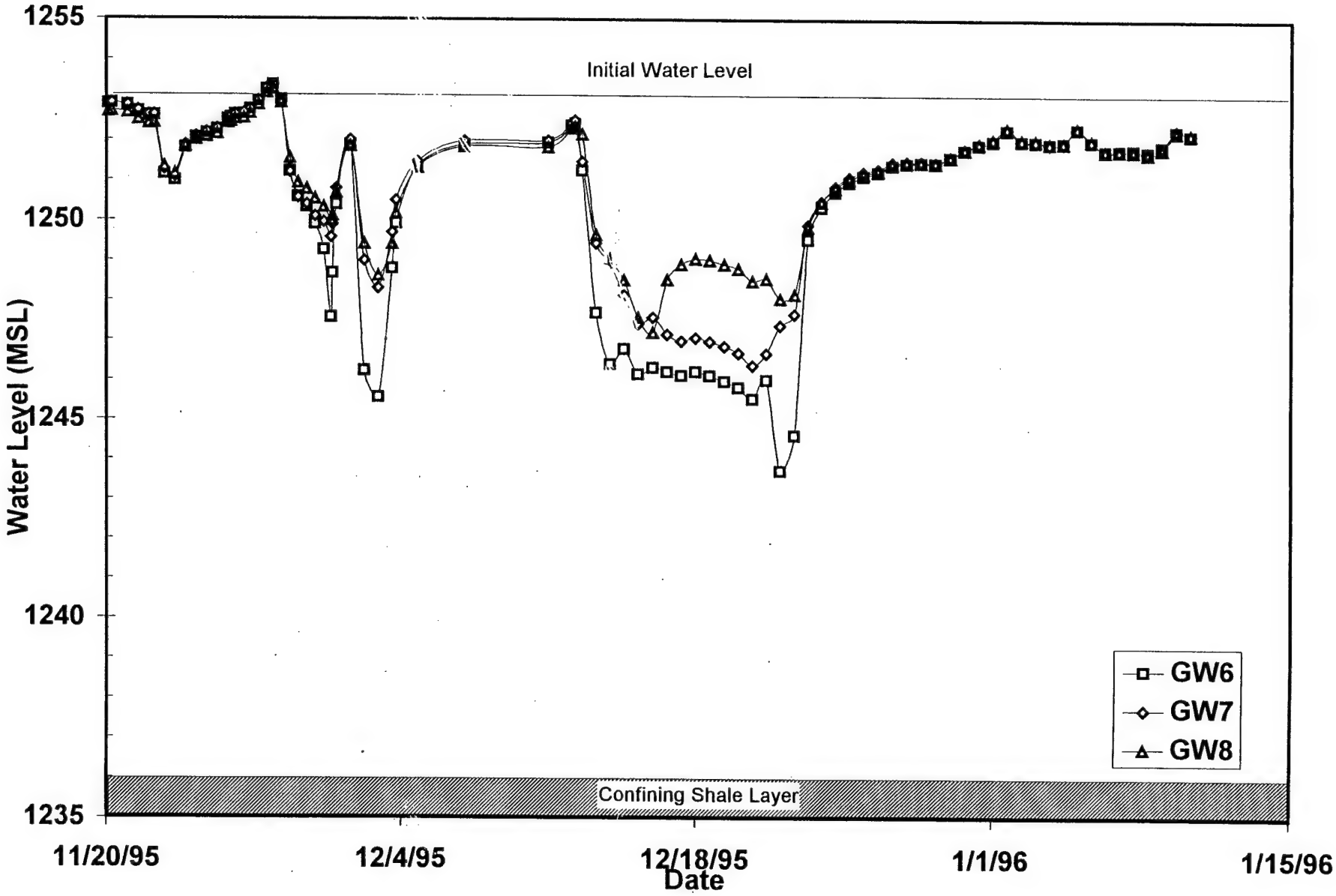

Figure 17. **Groundwater-Level Data for Wells GW6 to GW8 (20 November 1995 through 15 January 1996**

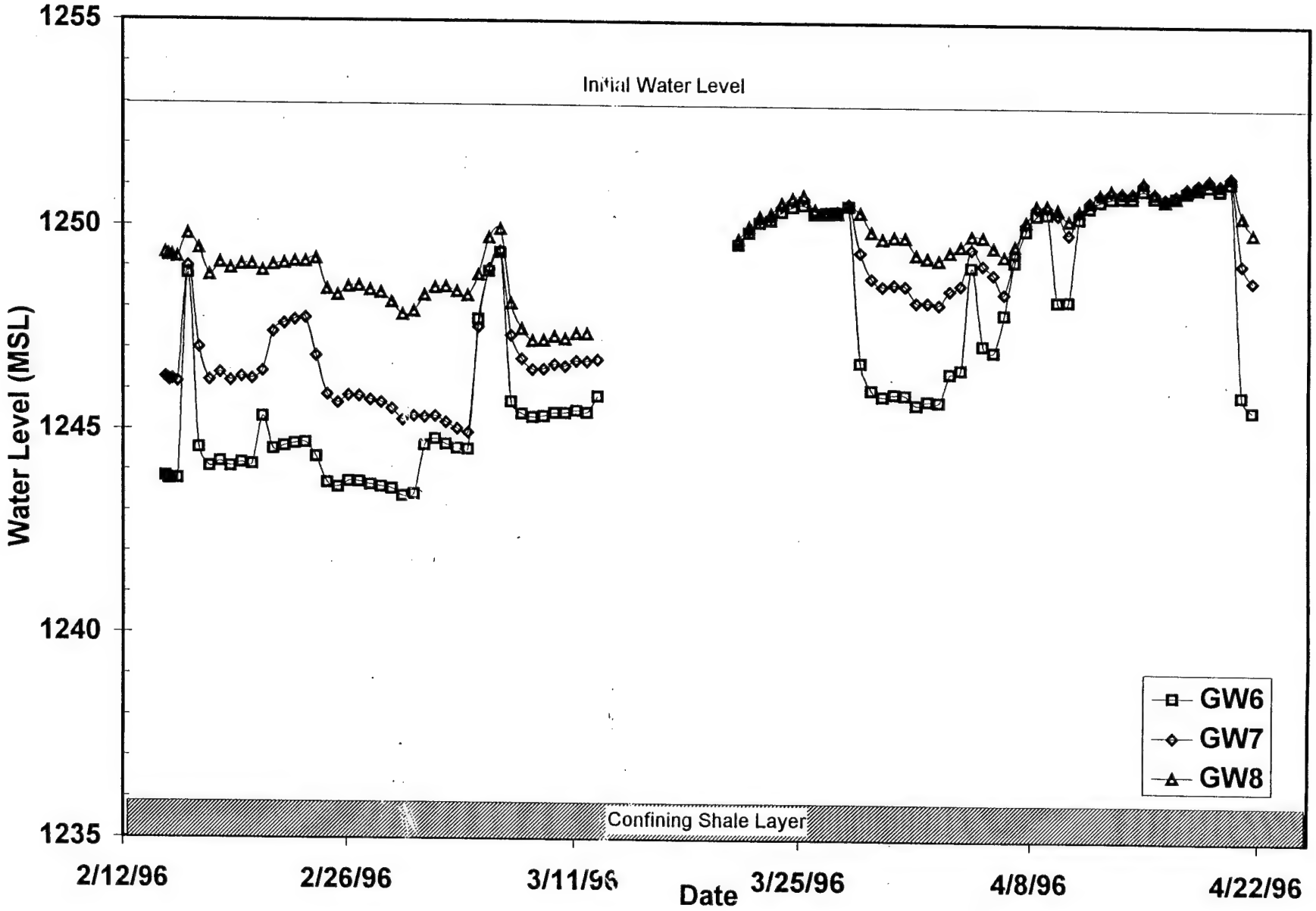

Figure 18. **Groundwater-Level Data for Wells GW6 to GW8 (12 February 1996 through 22 April 1996)**

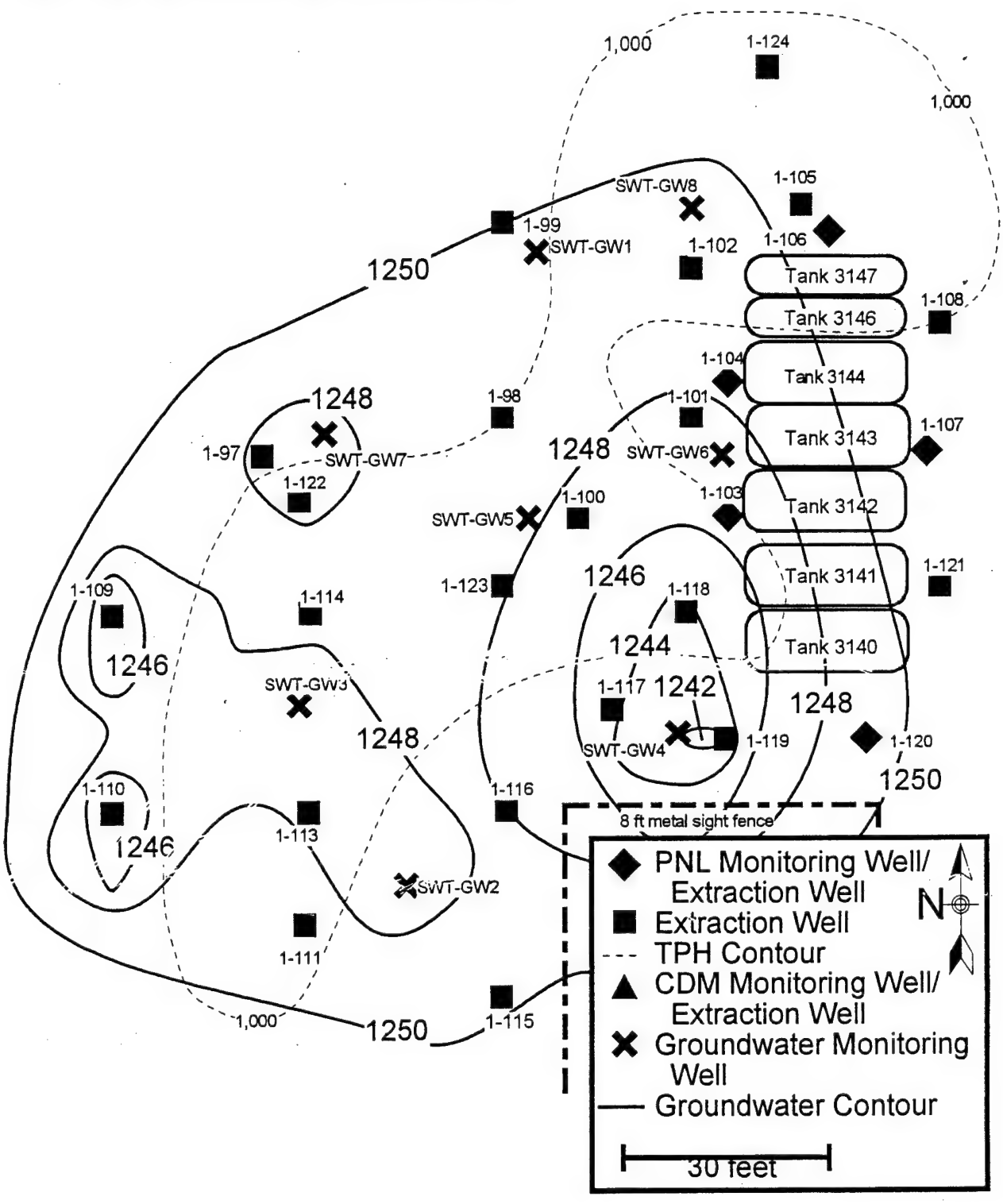

Figure 19. Groundwater-Level Contours for 20 December 1995

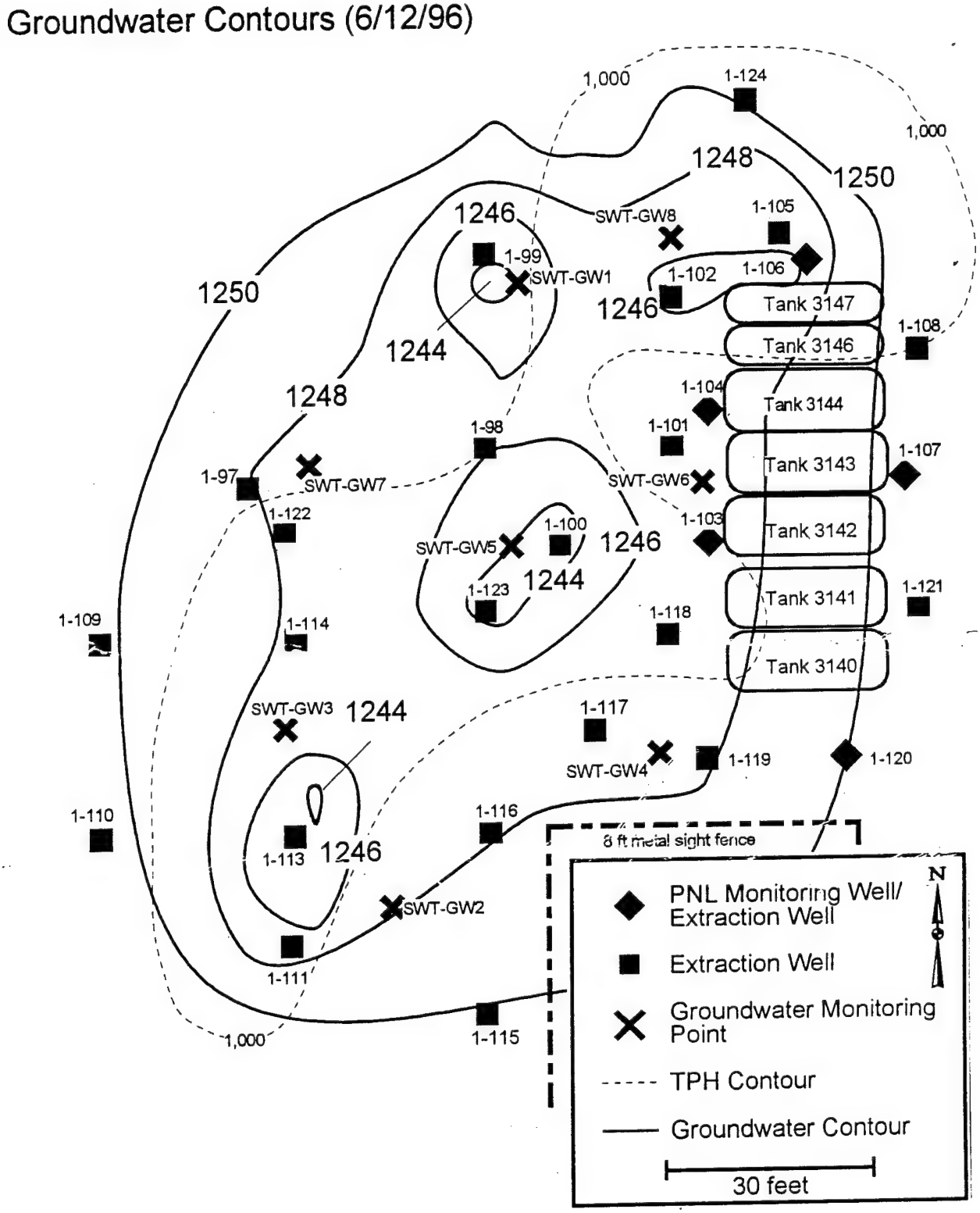

Figure 20. Groundwater-Level Contours for 12 June 1996

Table 3. Representative Soil Gas Survey Data Taken During Operations

Well ID	Depth (ft)	Oxygen Concentration (%) Versus Time			Carbon Dioxide Concentration (%) Versus Time			TPH Concentration (ppmv) Versus Time		
		5/3/96	5/10/96	6/17/96	5/3/96	5/10/96	6/17/96	5/3/96	5/10/96	6/17/96
SG-30	5	19.0	15.0	20.0	1.8	4.0	0.8	520	>10,000	>10,000
SG-30	11	15.0	10.0	19.5	3.5	6.0	0.8	6,400	>10,000	>10,000
SG-30	17	18.5	19.0	15.5	1.8	1.9	3.5	2,000	>10,000	>10,000
SG-31	5	18.0	18.0	7.5	2.8	3.5	7.5	8,200	1,200	200
SG-31	11	7.0	6.0	7.0	9.5	11.0	8.0	>10,000	>10,000	>10,000
SG-31	17	14.5	19.0	17.5	5.0	1.5	1.5	>10,000	>10,000	>10,000
SG-33	5	20.0	20.0	19.5	1.0	1.5	1.5	9,800	7,500	20
SG-33	11	5.5	7.0	17.0	6.5	8.0	2.0	5,400	>10,000	49
SG-33	17	11.0	11.0	16.5	5.5	6.5	3.0	>10,000	>10,000	>10,000
SG-35	5	19.0	19.0	17.5	1.8	1.5	1.5	320	>10,000	7,300
SG-35	11	NF	NF	20.5	NF	NF	0.3	NF	NF	190
SG-35	17	17.0	17.0	19.5	4.0	4.5	1.0	>10,000	>10,000	1,000
SG-36	5	2.0	1.0	6.0	8.0	10.0	6.8	1,000	3,300	8,200
SG-36	11	2.0	1.0	6.0	9.0	12.0	3.5	5,600	7,100	660
SG-36	17	12.0	14.0	18.0	4.5	4.0	1.8	>10,000	>10,000	>10,000
SG-37	5	18.5	19.0	18.5	1.5	3.0	2.8	7,000	5,200	72
SG-37	11	NF	NF	15.0	NF	NF	2.0	NF	NF	1,700
SG-37	17	20.0	20.0	17.0	1.5	1.5	2.0	680	6,800	>10,000

NF = no air flow.

3. Hydrocarbon Mass Removal

Removal of TPH in clay soils is the overall goal of the demonstration. To meet this goal, the bioslurper system was installed and monitored in a manner such that total TPH removal in vapor, groundwater, free product, and by biodegradation can be measured or quantified.

a. Hydrocarbon Mass Removal in Groundwater. During the technology demonstration, 1.12 million gallons of groundwater were withdrawn from the SWT Site. Exposure of these subsurface sediments allowed significantly greater mass transport of oxygen to contaminated zones compared to aqueous-phase delivery of oxygen. When in operation, the system removed 400 to 600 gallons per hour to maintain a steady dewatered condition. Calculations of TPH mass removed in the groundwater were made by taking the average TPH concentration of 4.4 mg/L and multiplying by the total volume of extracted groundwater. Even with the large amounts of groundwater withdrawn, only 18 kg (40 lb) of TPH removed could be accounted for in the groundwater stream.

b. Hydrocarbon Mass Removal in Soil Gas. As the result of bioslurping to dewater the site and draw in atmospheric air, a significant amount of TPH vapor was withdrawn from the site Figure 21 shows the measured concentration of TPH in the extracted gas over the entire period of operations. In the initial part of the demonstration operations phase, extracted TPH concentrations were greater than 20,000 ppmv. However, as the system was run for longer durations, the extracted TPH concentration reduced to approximately 7,500 ppmv TPH (25 mg/L) for the remainder of the demonstration. This type of behavior is a common observation and is well documented in the literature for soil vapor extraction sites. BTEX concentrations also were measured in soil gas. These results are given in Table 4.

The current maximum allowable TPH discharge limit on nonpermitted operations in Oklahoma is 1 lb TPH/h (0.45 kg TPH/h). Currently, the bioslurper system is emitting approximately 7,500 ppmv (4.5 lb/h). This value is above the Oklahoma regulatory level, but system operations could easily be modified to reduce emissions to meet this criteria.

During the demonstration, soil gas extraction rates averaged 49 cfm (83,000 L/h) containing TPH concentrations that ranged from approximately 4,900 to 27,000 ppmv (16 to 89 mg/L). The average TPH concentration was 33 mg/L. This resulted in average atmospheric TPH discharge rates of 2.7 kg/h (6 lb/h), with a maximum measured discharge rate of 6.6 kg/h (15 lb/h).

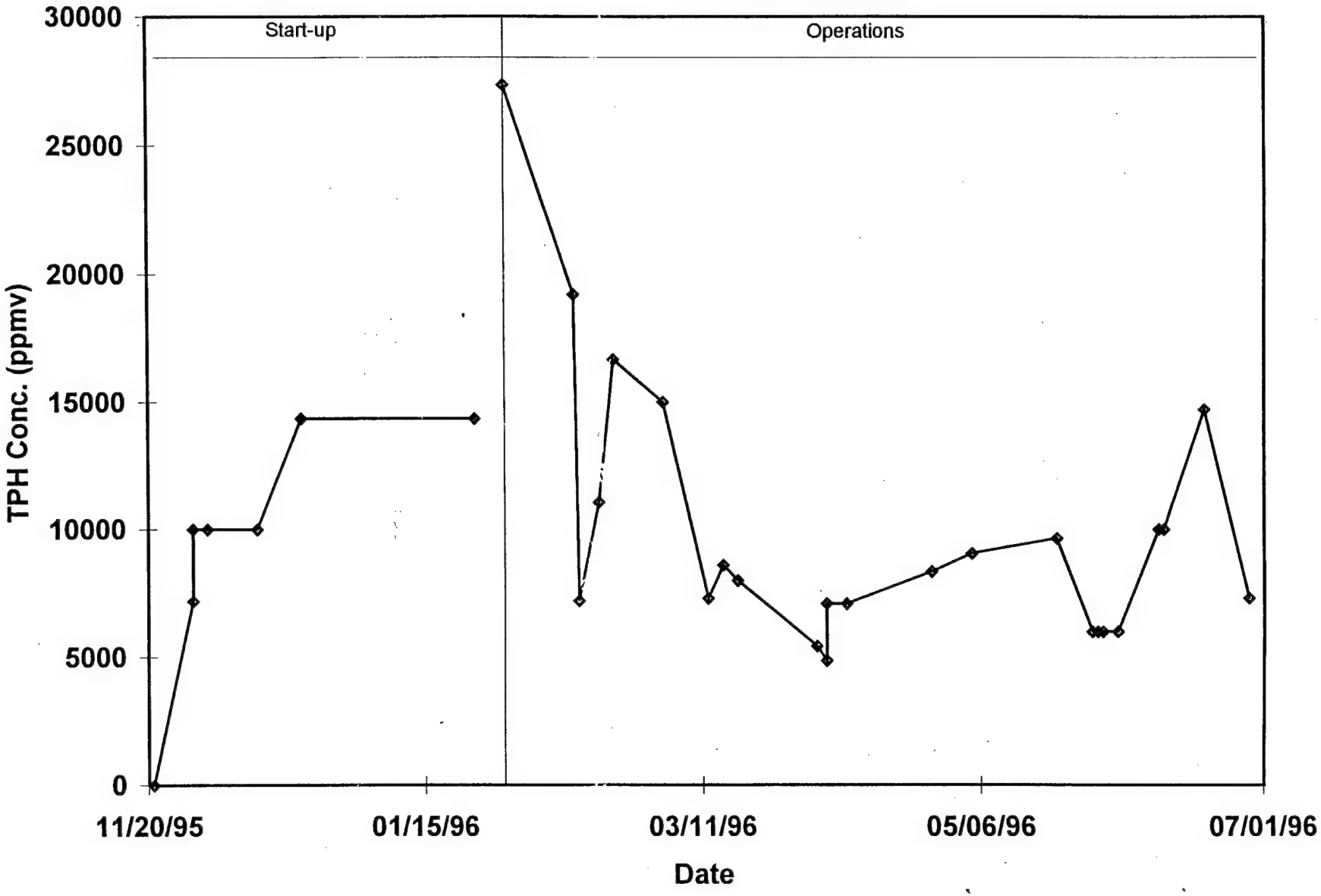

Figure 21. Measured TPH Concentration in the Extracted Soil Gas During Operations

Table 4. Measured Concentrations of BTEX Compounds

Date (m/d/y)	Sample ID	Benzene µg/L (ppmv)	Toluene µg/L (ppmv)	Ethylbenzene µg/L (ppmv)	Total Xylenes µg/L (ppmv)
11/2/95	SWT-AE-1	57 (18)	2209 (579)	11 (2)	67 (15)
2/13/96	SWT-AE-2	190 (60)	2000 (530)	20 (4.6)	20M (49M)
2/28/96	SWT-AE-3	420 (130)	4200 (1200)	34 (7.8)	340 (77)
4/26/96	SWT-AE-4	210 (64)	1700 (440)	17 (3.8)	170 (39)
5/9/96	SWT-AE-5	210 (65)	2200 (580)	23 (5.2)	240 (55)
5/20/96	SWT-AE-6	18 (5.5)	1600 (420)	15 (3.5)	200 (46)
5/21/96	SWT-AE-7	280 M (86 M)	2000 (520)	34 (7.6)	280 M (64 M)
6/7/96	SWT-AE-8	210 (65)	1400 (360)	42 (9.5)	240 (54)
6/17/96	SWT-AE-9	210 (64)	1700 (440)	39 (8.9)	360 (81)
7/1/96	SWT-AE-10	320 (99)	3600 (950)	79 (18)	530 (120)

M - May have a small amount of matrix interference.

Some treatment may be required to meet this discharge limit. The calculated total mass of TPH removed by bioslurping was 8,400 kg (19,000 lb).

c. Hydrocarbon Mass Removal Via Biodegradation. Over 1,950 kg (4,300 lb) of TPH was destroyed through bioremediation during the technology demonstration. This is 20 percent of the total TPH removed from the site during operations. Because all of the oxygen injected through the shallow bioventing system is probably not recovered in the bioslurper stack effluent, the estimate of the mass of TPH biodegraded is conservative.

The use of the liquid ring pump to extract fluid from the site enabled the calculation of a site-wide biodegradation efficiency. This is because the soil gas from the site was collected to one vessel (the LRP recycle reservoir) where it could be sampled. It was assumed that the soil gas reaching this vessel was a representative sample of the overall site soil gas concentrations. The only supply of air into the site was ambient air, although both the shallow bioventing system and fractures reaching the ground surface were probably ambient air supply routes. The decrease in soil gas oxygen concentration from the concentration supplied (20.9 percent) to the average concentration of

18.8 percent sampled from the liquid ring pump stack on top of the recycle reservoir was assumed to be due to biological utilization in the respiration of contaminant. While iron does impart an oxygen demand, this was assumed to minimal after the system had been aerated for an extended period. Reduced iron does not last long in a well-aerated environment and the site was demonstrated to be well-aerated shortly after system start up.

The total mass of oxygen utilized for biodegradation was used to calculate the total mass of contaminant removed by that mechanism.

d. Summary. As shown in Figure 22, the system installed at the SWT Site removed a total of 11,000 kg of TPH (24,000 lb TPH) in a total of 8 months on site through volatilization, free product and contaminated groundwater removal, and biodegradation. Most of the TPH (9,900 kg [22,000 lb]) was removed between January 1996 and the end of the demonstration. During this time, the average TPH removal rate was 66 kg/day (150 lb/day). The most significant removal process was via the extraction of soil gas by the liquid ring pump. This process is similar to soil vapor extraction, but has two significant differences: (1) the system is designed to dewater the site and maximize biodegradation, not to maximize volatilization as with SVE; and (2) the vapor flow rates required to accomplish the system objectives are at least one order of magnitude lower than those that would accompany an SVE system. Removal of vapor-phase contaminants accounted for 79.7 percent of the total TPH removed during the system operations. Bioremediation accounted for the remaining 20.0 percent of the total TPH removed from the site, whereas groundwater extraction (comparable to pump and treat) removed only 0.3 percent of the total.

C. FIELD TESTS

1. In Situ Respiration Rates

Result of a typical in situ respiration test at the SWT Site is presented in Figure 23. The figure illustrates the oxygen, carbon dioxide, and TPH as a function of time during the test. The oxygen utilization rates measured at this site ranged from +0.68 to -5.06 percent O_2/day, with the negative value representing oxygen consumption. The positive respiration rate indicates that oxygen was being replenished during the test to a monitoring point that was previously somewhat depleted in oxygen. This may be an effect of groundwater reinfiltration, or barometric pumping, or both.

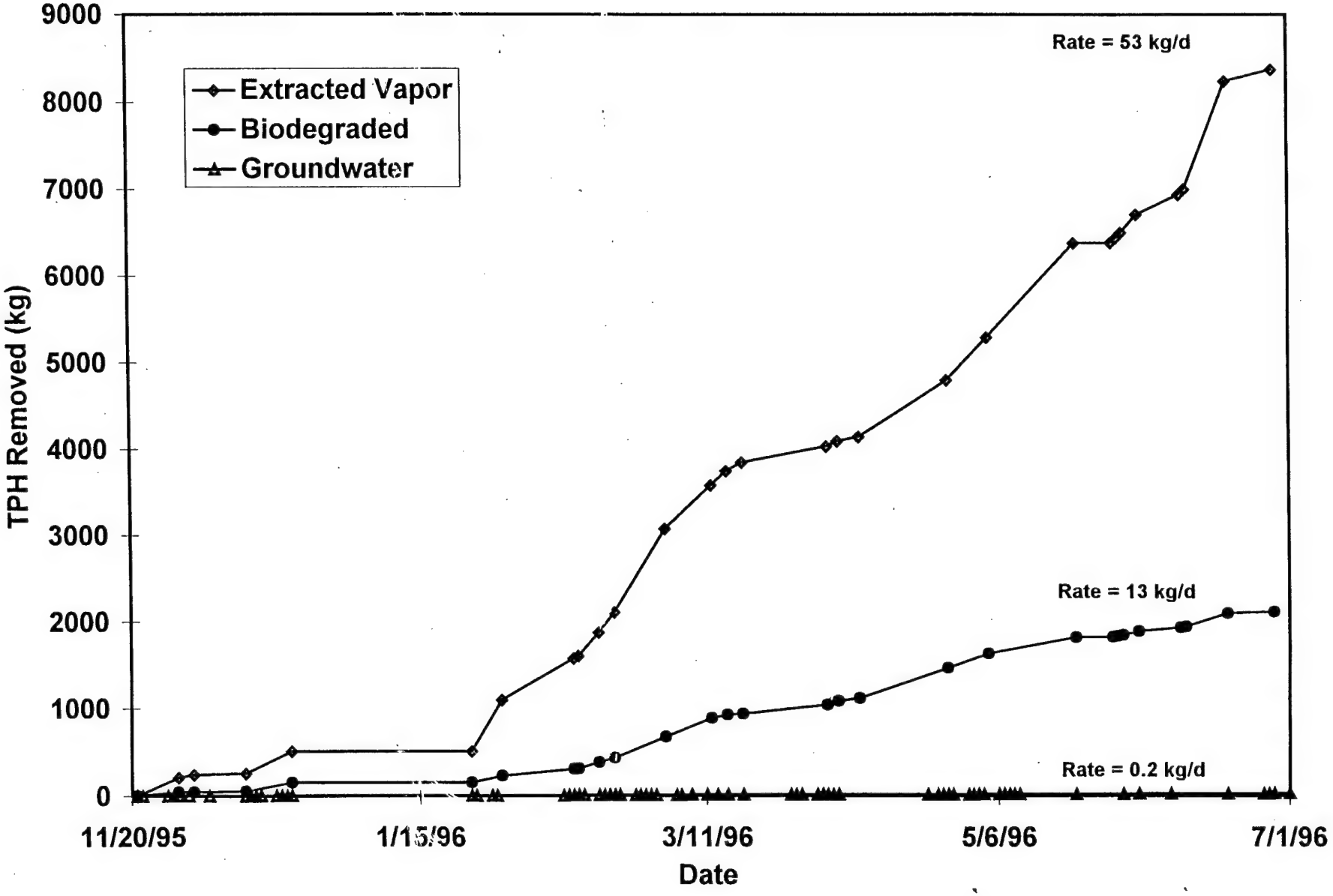

Figure 22. Rates of TPH Removal Attributable to Soil Vapor Extraction, Bioremediation, and Groundwater Extraction

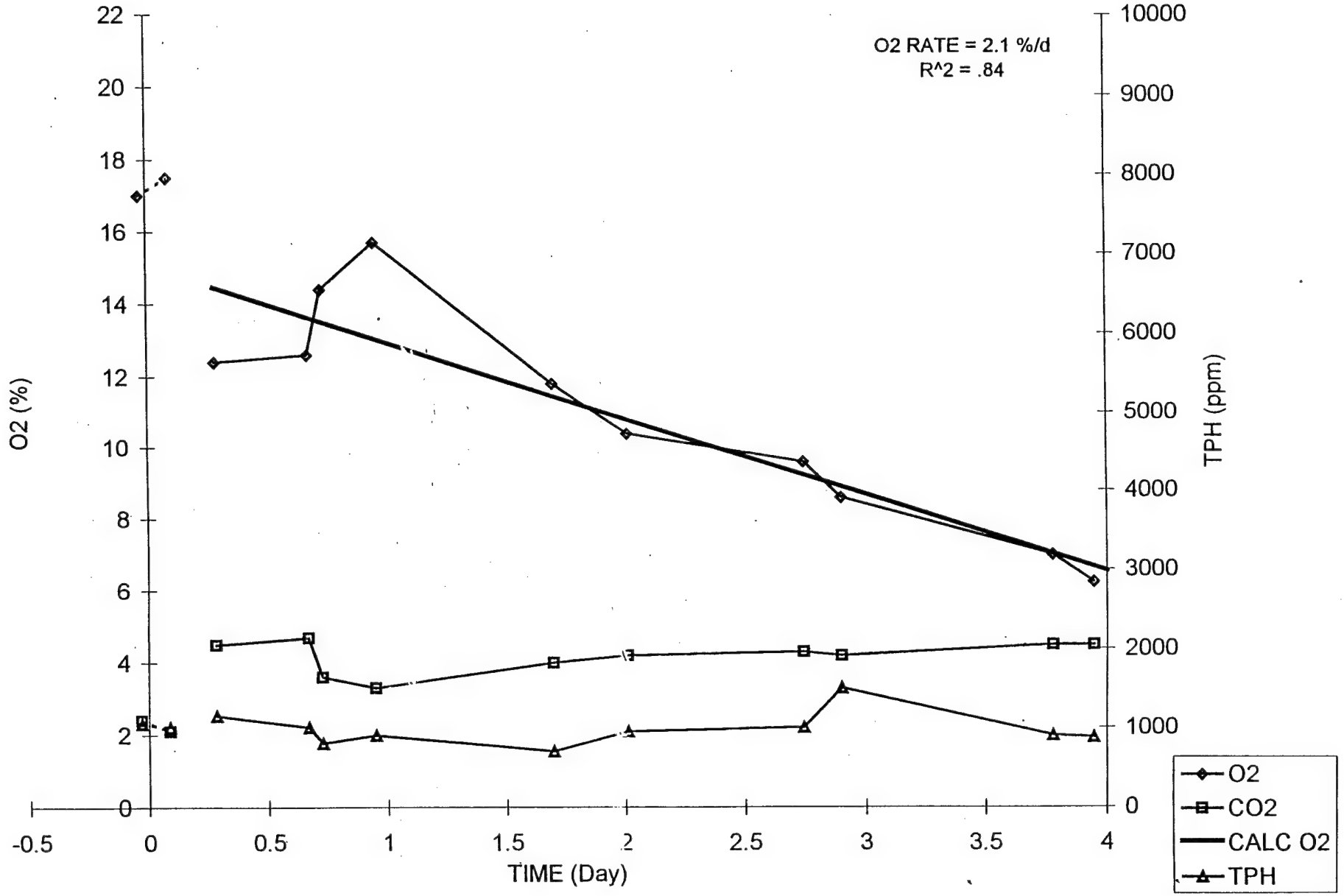

Figure 23. **Typical Results from an In Situ Respiration Test: Monitoring Point 06SG-36-5′, 18 March 1996**

Oxygen utilization rates and the calculated biodegradation rates are summarized in Table 5. The biodegradation rates calculated ranged from 0 to 1,474 mg TPH/kg soil-yr.

2. Helium Tracer Tests

Two helium tracer tests were conducted as part of the characterization, design, and operation of the demonstration. The first helium tracer test was conducted October 1995 to determine airflow characteristics of the upper clay layer and to demonstrate the connectivity of the shallow vent wells and the deep extraction wells. Helium was monitored in the soil gas monitoring points at depths of 5, 11, and 17 feet. The volumetric flow rate of the shallow bioventing system during that time period increased nearly linearly from 2 to 18 cfm over the 94.8-hour duration of the test.

Figures 24 and 25 show data typical of the helium tracer test. It can be seen in Figure 24 that helium concentrations were slightly erratic at first and then stabilized at a steady level that eventually tailed off after about 80 hours. At 11 feet, MP 35 produced no soil gas, only water. Therefore the helium readings at this point were not taken. Figure 25 shows the connectivity of helium to all screened intervals at monitoring point 06SG-36. It can be seen that even though the helium injection ceased after 24 hours, the maximum helium concentration was reached after nearly 50 hours.

The second helium tracer test was performed during site operations including dewatering and operation of the entire system. This test was designed to allow the tracking of air flow through the formation to the bioslurper stack during system operation. In addition, the helium was used as a tracer for respiration tests to determine the extent of air flow through the formation and the potential effects of barometrically induced air movement on the respiration test results. The time-averaged injected helium concentration was 6.3 percent at a volumetric flow rate of 1.2 acfm for 24 hours. A significant amount of helium was injected into the system. Even with this helium mass injected, little helium was recovered at the stack or at any other monitoring points, indicating that there may have been an undetected leak at the point of helium injection. Therefore, the results of this test were inconclusive.

Table 5. Biodegradation Rates Calculated from In Situ Respiration Tests

Well ID	Depth (ft)	Oxygen Utilization Rate (%O_2/day)		Biodegradation Rate (mg/kg-yr)	
		3/18/96	6/19/96	03/18/96	06/19/96
SG-30		0.95	0.92	277	268
SG-30	11	1.32	1.06	384	309
SG-30	17	0.37	-3.67	108	0
SG-31	5	1.95	1.11	568	324
SG-31	11	-0.68	0.86	0	251
SG-31	17	0.32	0.19	93	55
SG-31	24	nm	6.66	nm	1941
SG-33	5	0.45	0.02	131	6
SG-33	11	1.33	1.37	387	399
SG-33	17	0.33	-0.17	96	0
SG-35	5	0.25	0.30	73	87
SG-35	11	NF	NF	NF	NF
SG-35	17	0.039	0.09	11	26
SG-36	5	2.12	-0.36	617	0
SG-36	11	11.5	-0.45	3346	0
SG-36	17	0.12	0.05	35	15
SG-37	5	0.36	0.12	105	35
SG-37	11	NF	0.19	NF	55
SG-37	17	-0.12	-0.40	0	0
Average[1]	--	1.07	1.00	312	291

NF = no air flow.

[1] Average includes only oxygen consumption.

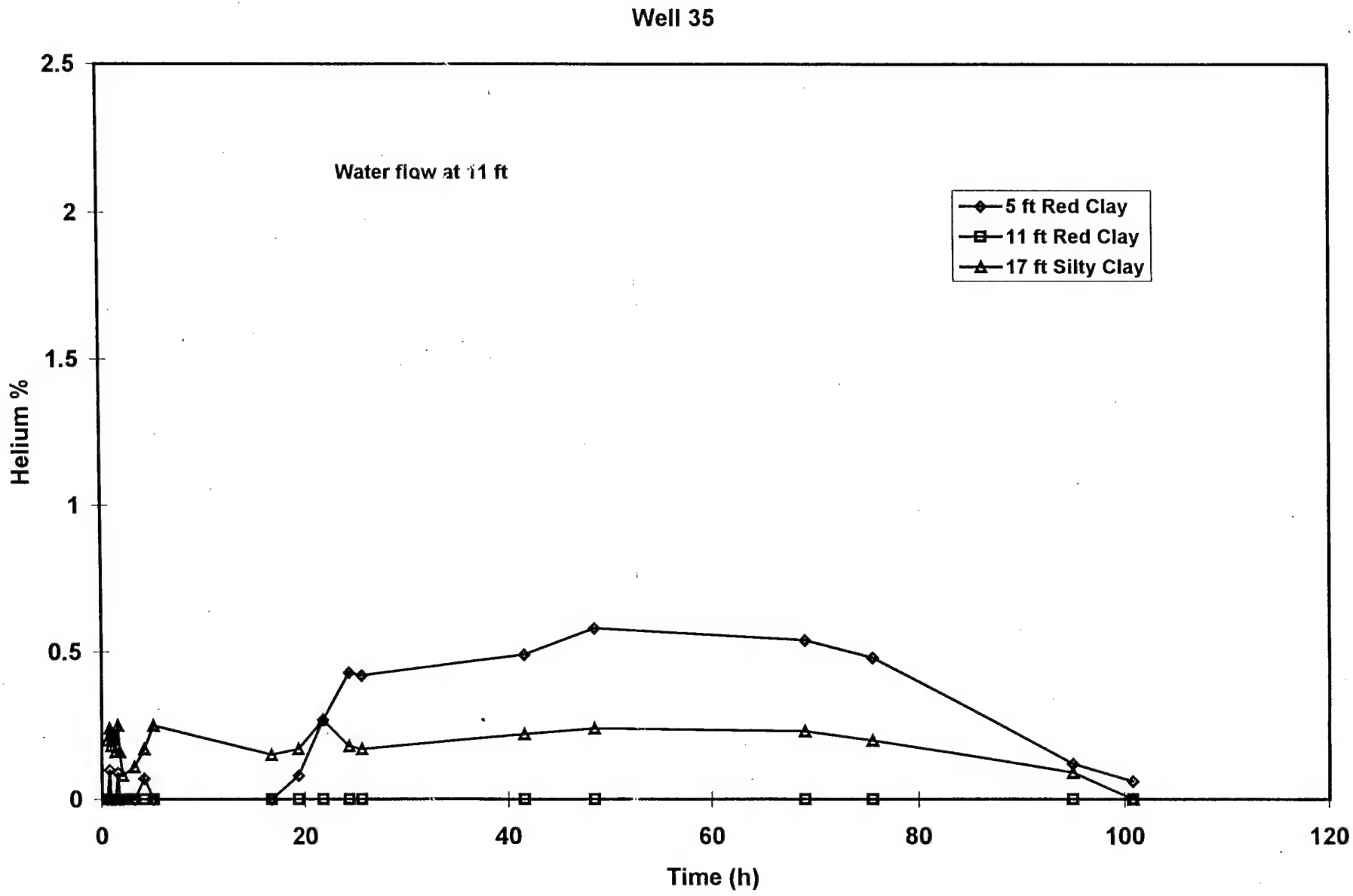

Figure 24. Results from the Helium Tracer Test: Monitoring Point 06SG-35

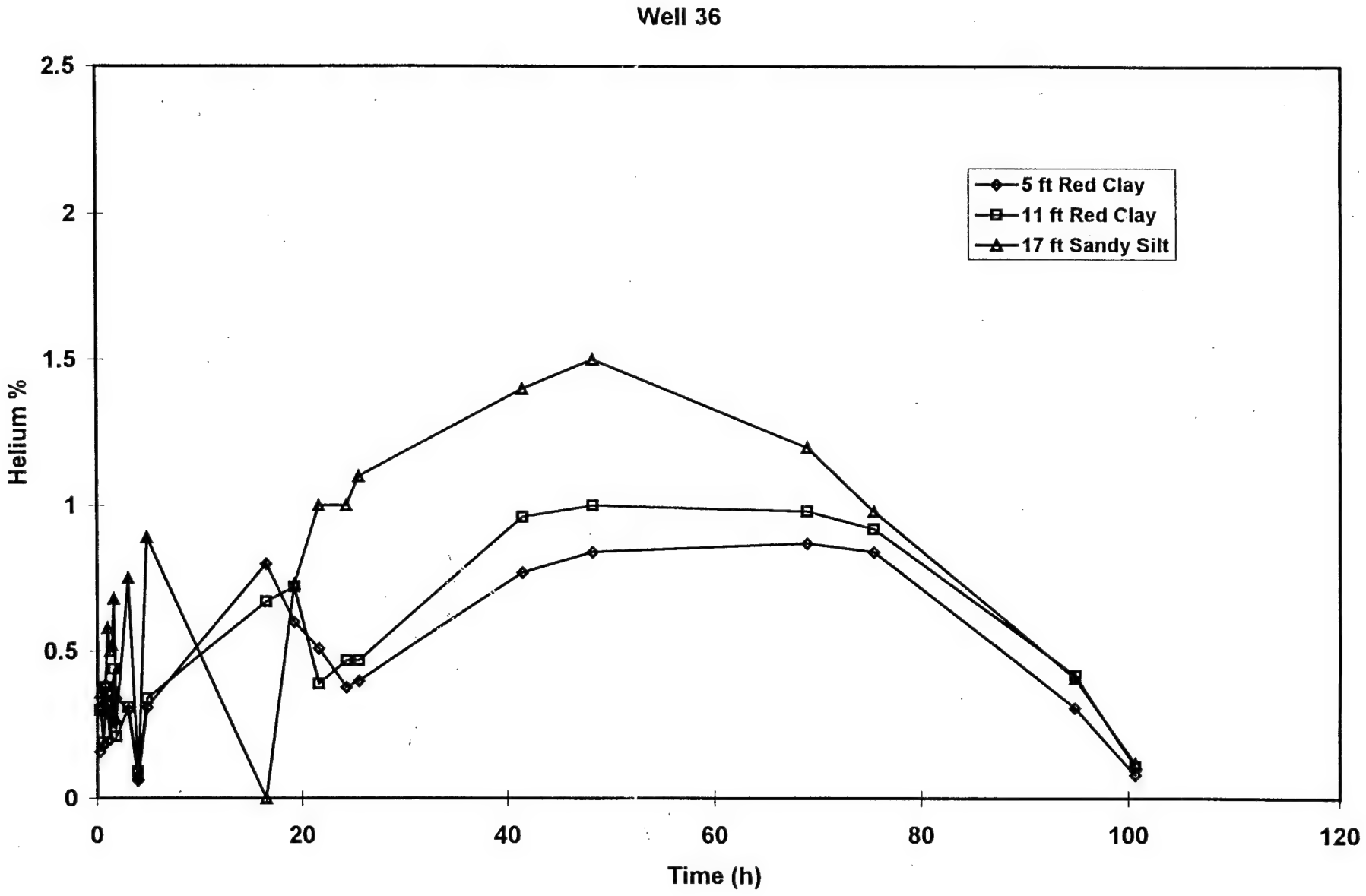

Figure 25. Results from the Helium Tracer Test: Monitoring Point 06SG-36

SECTION V
PROJECT CLOSEOUT REQUIREMENTS

Completion of a site remediation with bioslurping requires establishing and documenting statistical evidence that the cleanup goals have been reached. An overview of project closeout requirements is given in the sections below. These sections describe the minimum activities typically required to close out a full-scale bioventing/bioslurping system.

A. SOIL GAS SAMPLING

The number of samples required to demonstrate a statistically valid conclusion renders the cost of soil analysis prohibitive until contamination concentrations approach 90 to 99 percent of the cleanup goal. Minimizing soil sampling will make a remediation effort much more cost effective. Therefore, in situ respiration testing should be used as the primary indicator for starting site closure procedures. With bioslurping systems, in situ respiration testing can indicate when the site is clean and therefore when to collect final soil samples. As site remediation progresses and contaminants are degraded, the measured in situ respiration rates will approach background respiration rates. When the in situ respiration rate in the contaminated area approaches that in the uncontaminated area, this is a good indication that the site is remediated and final soil sampling can be conducted. The oxygen concentration should be measured in soil gas taken from a nearby uncontaminated location with a geology similar to that of the contaminated area. If the oxygen content in soil gas is greater than 15 percent in the uncontaminated location, the background respiration rate is low and no further measurements are needed. If the oxygen content in soil gas from the uncontaminated area is less than 15 percent, the background in situ respiration rate should be measured by injecting air to increase oxygen concentrations then monitoring oxygen utilization rates in the uncontaminated area.

B. SOIL ANALYSIS

For nearly all sites, soil cleanup goals are stated in terms of contaminant concentrations in soil. A variety of approaches are conceptually possible for defining the required cleanup goals for a bioslurping site, but in practice soil sampling is the most common method used to demonstrate compliance. However, due to the high cost and potential disruption to site operations, soil sampling should not be used for routine process monitoring.

The number of final soil samples collected usually is driven by a regulatory requirement to demonstrate a high confidence that the required cleanup goals have been achieved. The plan for collecting soil samples should be designed on a sound statistical basis as described in ASTM D 4687, "Standard Guide for General Planning of Waste Sampling." Sample locations should be selected using a simple random or systematic random probability method so that the analytical results can be evaluated using statistical theories.

Different cleanup goals will be specified if different contaminants are present. Petroleum hydrocarbons are the most common contaminant treated by bioventing, so the most common cleanup goal specification is based on TPH. BTEX frequently are components of petroleum hydrocarbon materials. The BTEX compounds are more mobile, more toxic, and more biodegradable than TPH compounds. When BTEX compounds are present, the cleanup goals required for these compounds will be more stringent than for TPH.

Laboratory determination of concentrations of organic compounds in soils typically is performed in two steps:

- collection of the compounds from the soil
- detection of the collected compounds.

Collection may be accomplished by either a purge-and-trap method or an extraction method. Purge-and-trap methods (e.g., EPA SW-846 Method 5030) are most appropriate for VOCs such as gasoline or BTEX. Extraction methods (e.g., EPA SW-846 Method 3510) are more appropriate for semivolatile organic compounds (SVOCs) such as the main TPH components of diesel fuel or heavy oil.

The measured concentration of hydrocarbons in soils typically shows wide variability due to the heterogeneous distribution of contaminants in the soil. Statistical analysis is needed to allow a meaningful comparison of the results with the action limit. Typically, the upper confidence limit (UCL) of the measure of the distribution of contaminant concentrations is compared to the action limit. The UCL must be determined by applying the statistical analysis for the appropriate distribution type. The analytical results should be checked to determine how the data are distributed (Gilbert, 1987). The population may be distributed in one of the following ways:

- normally
- lognormally
- nonparametrically.

Although many populations of environmental contaminant concentrations are lognormally distributed, a lognormal distribution should not be assumed without justification (U.S. EPA, 1989, EPA/530-SW-89-026).

A confidence level of 100 percent would be desirable but would require taking an infinite number of samples so the acceptance of cleanup is usually based on the 95 percent UCL. If the calculated 95percent UCL is below the cleanup goal, the site cleanup is complete. If the 95 percent UCL is slightly above the cleanup goal, additional sampling may result in lowering the UCL, particularly when the standard deviation of the distribution is large. The decision of taking additional samples or continuing the remediation includes consideration of these factors:

- the cost of sampling versus the cost of continued remediation
- the current in situ respiration rate
- consideration of regulatory acceptance.

C. WELL ABANDONMENT

Well abandonment and plugging procedures should ensure that (1) the well does not become a source or channel for groundwater contamination and (2) the well does not allow a pathway for pressure loss from a confined aquifer. Abandonment and plugging typically require that the well be filled with cement, bentonite slurry, or crushed bentonite and then capped with a cement plug. Many states and localities have regulations providing specific technical and documentation requirements for well abandonment. In all cases, the local regulations should be considered as the minimum requirement.

D. DOCUMENTATION

Attainment of cleanup goals and completion of bioslurping project closeout activities should be documented in a site closure certification report. Before preparing the closure report, the contractor should determine the format and content required by the lead regulatory agency. A typical closure certification report will cover the following topics areas:

- site history, contaminants, cleanup goal, and remedial actions
- the results of sampling and analysis to ensure attainment of cleanup goals
- a description of well abandonment activities
- any measures required for permanent site maintenance (the Operations and Maintenance Plan)
- any required deed restrictions.

SECTION VI

CONCLUSIONS AND RECOMMENDATIONS

This section includes a brief review of the results and the conclusions drawn from the demonstration at Tinker AFB SWT site. It also includes the recommended strategy for long-term operations at the site based on what was learned during the demonstration.

A. CONCLUSIONS

The bioslurping/bioventing system installed dewatered the site and exposed soil contamination that was trapped below the groundwater table to oxygen in concentrations capable of supporting biodegradation. The average water removal rate during liquid ring pump operation of 575 gph was adequate to maintain the site with the lowered groundwater table. While the total volume of groundwater removed from the site during the demonstration was large (1.12 million gallons), the total mass of contaminant removed in the water was minimal due to low contaminant solubility.

The shallow bioventing system was demonstrated to be capable of aerating the upper clay layer adequately to support biodegradation of contaminant in that soil layer as well. The carbon vane pump was shown to achieve injection pressures which were capable of pushing the fracture-resident water out and therefore open more channels for air flow in the fractured clay. Soil gas oxygen concentrations in samples collected in the clay layer were almost uniformly above 5 percent, the concentration at which it has been demonstrated that oxygen becomes biodegradation rate-limiting.

Helium tracer tests confirmed that air injected via the shallow bioventing manifold system did move to the deeper strata by advection, and that fractures facilitated vapor transport throughout the upper clay layer covering the site. The presence of these fractures was confirmed by the results of soil gas monitoring around the site.

In situ respiration rate tests performed at discrete-depth soil gas monitoring points indicated that the soil formation has significant biodegradation capacity on the order of 3 mg/kg-d, well within the typical range demonstrated by the Air Force and EPA's Bioventing Initiative of over 130 bioventing sites around the world. In addition, the bioslurper/bioventing system was configured in such a way that facilitated the calculation of a site-wide biodegradation rate, because the soil gas from the site was collected to a single reservoir fitted with a sample collection port. Site-wide biodegradation was calculated (with conservative assumptions) to account for 20 percent of total hydrocarbon removal, or 1,950 kg (4,300 pounds).

A majority of contaminant was removed in the vapor phase concomitant with the slurping action of the liquid ring pump. During the demonstration, 8,400 kg (19,000 lb) of contaminant was removed in the vapor phase. While the system was designed to enhance in situ biodegradation of contaminants, this removal rate adds significantly to the total removal effectiveness of the system.

B. RECOMMENDATIONS

1. Site Dewatering and Soil Gas Extraction Rates

This was the first demonstration to use a bioslurping system to dewater a large volume of aquifer sediments. Operational data obtained in this demonstration have proven that the installed bioslurper system has the power and capacity to extract over 600 gph of groundwater from 32 feet BGL. This relatively high groundwater extraction rate necessitates a relatively high soil gas extraction rate, resulting in more volatilization that would occur during just bioventing. However, the dewatering to nearly 11 feet below the natural water table level is necessary to expose contaminated soils to air for significant biodegradation to occur. The ratio of volatilization to biodegradation occurring at the site is likely to decrease with time as the more volatile components are removed.

When the system is operated with all 19 bioslurper wells active, some of the wells have greater water production than others. To optimize the air/water ratio of the fluid drawn from the site, it is recommended that the system be operated with the liquid ring pump connected only to wells with relatively high water production rates, thus maximizing water production (dewatering) and minimizing soil gas extraction. This configuration also will allow even groundwater extraction from all active wells.

2. Treatment or Reduction of Bioslurper Off-Gas

Treatment of bioslurper off-gas would only be necessary if a permit is not obtained that allows Tinker AFB to exceed the current TPH discharge limits. However, if TPH discharge limits are applicable, the current maximum allowable TPH discharge limit on nonpermitted operations in Oklahoma is 1 lb TPH/h (0.45 kg TPH/h). Currently, the bioslurper system does emit above this level. Four options may be considered for off-gas treatment or reduction.

Reinjection of the extracted off-gas is the method of choice. The bioslurper wells have been configured to allow for either injection or extraction; therefore, some wells could be modified to

allow for injection while still extracting from others for dewatering. This configuration would most likely result in less dewatering; however, as volatiles are removed, off-gas reinjection would not be necessary and the site could again be dewatered to the design level of 32 feet BGL.

Second, given that volatilization will decrease with time, it may be practical to reduce the groundwater extraction rate, subsequently reducing the soil gas extraction rate, resulting in decreased emissions. Dewatering would not occur to the design level of 32 feet BGL; however, as the volatiles are removed from the system, groundwater extraction rates could be increased to meet the original design level and still meet any regulatory limits. This option would be the most economical, although it would increase remediation time.

Third, dewatering and soil gas extraction could be decoupled to a degree by dewatering with submersible pumps in some of the wells. This also would allow for decreased soil gas extraction rates. This option would be more expensive than Option 1, but there would be no initial sacrifice of the dewatering design level. Submersible pumps typically cost between $1,000 to $2,000 per pump.

Finally, if the system is operated under the current configuration, an option that was investigated for liquid ring pump stack gas treatment at the SWT Site was the installation of a biofilter. A biofilter is a biological unit operation specifically designed for the treatment of vapor-phase biodegradable contaminants such as the TPH vapor extracted from the SWT Site. The cost of biofiltration typically is about 70 percent that of incineration or adsorption on activated carbon. Biofilters have been used to treat a variety of volatile components, including BTEX. Installation of a biofilter would allow the dewatering design level to be met, but would be quite costly compared to reinjection of off-gases.

3. Groundwater Disposal

A limitation to the continuous operation of the bioslurper system was the need to haul extracted groundwater to the Tinker AFB CERCLA water treatment facility. A sewer line to this facility that runs through the SWT Site originally was targeted for groundwater discharge. However, permission could not be obtained to discharge the water into the Building 3001 groundwater treatment collection system as originally proposed. Instead, the system was installed with two 6,200-gallon water storage tanks that had to be emptied twice daily (including holidays and weekends) to maintain full water removal capacity. In some cases, the tanks had reached capacity before being emptied, therefore halting operations until the stored groundwater could be removed.

Over 1.1 million gallons of contaminated groundwater were extracted from the SWT Site using the existing liquid ring pump and subsequently were hauled away for treatment and disposal. In addition to the significantly increased potential for an on-site spill, the cost of hauling this groundwater adds notably to the total cost of the project. For long-term operation of the SWT Site bioslurper remediation system, a serious effort should be made to allow the discharge of up to 10 gpm of extracted groundwater. This would eliminate the need for manual transport of contaminated groundwater.

SECTION VII

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APPENDIX A

CALCULATION OF FRACTURED CLAY OXYGEN CONCENTRATIONS

APPENDIX A - Calculation of Fractured Clay Oxygen Concentrations

The equation describing both oxygen diffusion and consumption within a radial soil/clay matrix can be derived from Fick's law and the oxygen conservation equation for soil gas. Assuming steady-state conditions and no convective air flow, the resulting equation for oxygen diffusion is

$$\frac{1}{R}\frac{d}{dR}\left(R\frac{dC}{dR}\right) = \frac{r}{D_s} \qquad \text{(A-1)}$$

where C is the soil-gas oxygen concentration (mass of oxygen per volume of soil air), R is the radial distance from the center of a clay fracture, r is the rate of oxygen consumption (mass of oxygen removed per unit volume of soil per unit of time) due to microbial activity (assumed constant), and D_s is the oxygen diffusion coefficient in soil. The following boundary conditions are applied:

$$BC\ 1) \quad At\ R = R_f \qquad C = C_0 \qquad \text{(A-2)}$$

$$BC\ 2) \quad D_s\frac{dC}{dR}2\pi R_f = r\int_{R_f}^{R} 2\pi R\,dR \qquad \text{(A-3)}$$

where C_0 is the oxygen concentration in the fracture, and R_f is the fracture radius. After integrating twice, the analytical solution of this equation with the boundary conditions applied yields the following equation:

$$\frac{C}{C_0} = 1 + \frac{r}{D_s C_0}\left[\left(\frac{R^2 - R_f^2}{4}\right) + \left(\frac{R^2}{2} - R_f^2\right)(\ln R - \ln R_f)\right] \qquad \text{(A-4)}$$

Equation 7 can be solved to give radial oxygen concentrations as a function of r and D_s. Values of r can be estimated from in situ respiration tests (Section 5.6.1). D_s can be related to the oxygen diffusion coefficient in air (D_a) according to

$$D_s = \tau_g D_a \qquad \text{(A-5)}$$

where τ_g is the gas tortuosity factor ($\tau_g<1$). Methods for estimating the magnitude of D_s for a given soil type are described in the next section. The solution to equation (1) depends on the choice of boundary conditions and the magnitude of both the soil gas diffusion coefficient (D_s) for oxygen and the oxygen consumption rate (r). Details regarding estimates of D_s and r are provided below.

The soil-gas diffusion coefficient for oxygen (D_s) can be measured for a field soil using laboratory or field methods. Because the performance of these measurements is time-consuming and expensive, it is in most cases simpler to use empirical models which relate the gas tortuosity factor τ_g (see Equation A-6) to specific bulk soil properties that are relatively easy to determine. Although numerous empirical models have been proposed for relating the gas tortuosity factor τ_g to the volumetric air content α of a given soil, because of its applicability over a wide range of α values, the Millington and Quirk (1961) model is particularly useful for estimating the gas tortuosity factor:

$$\tau_g = \frac{\alpha^{10/3}}{\theta^2} \qquad \textbf{(A-6)}$$

Porosity (θ) is defined as the volume of void space (= volume of soil gas and water) per total soil volume, whereas volumetric air content (α) is defined as the volume of gas space per total volume of soil. Porosity (θ) and volumetric air content (α) may be computed for a specific soil if the bulk density (ρ_b), particle density (ρ_p), and moisture (μ) are known:

$$\theta = 1 - \frac{\rho_b}{\rho_p} \qquad \textbf{(A-7)}$$

$$\alpha = \theta - \mu \frac{\rho_b}{\rho_w} \qquad \textbf{(A-8)}$$

Bulk density ρ_b is defined as the mass of dry soil per total soil volume and may be estimated from the dry weight of a soil core sample. Particle density ρ_p is the ratio of dry soil mass to unit volume of soil particles, the latter of which may be determined from the volume of water displaced by the soil particles (Blake and Hartge, 1986). Moisture content μ is defined as the mass of water per mass of dry soil and may be determined gravimetrically with oven drying. Finally, the density of water ρ_w is assumed to be 1 g/cm^3.

Using equations 3 to 5, the soil gas diffusion coefficient (D_s) can now be calculated as a function of soil moisture content (μ) and porosity (θ):

$$D_s = \frac{\left[\theta + \frac{\mu\rho_p}{\rho_w}(\theta - 1)\right]^{\frac{10}{3}}}{\theta^2} \cdot D_a \qquad \textbf{(A-9)}$$

As expected, the diffusion coefficient for oxygen in soil (D_s) increases with decreasing moisture content (μ). Because many soils have a porosity of approximately 50% (Brady, 1990) and because microbial activity is present as long as the moisture content is at least 50% of field capacity (Pope and Matthews, 1993), which translates into a μ value of 0.05 to 0.10 g water/g dry soil for most soil, it is expected that D_s will range from approximately 0.005 cm^2/sec to 0.04 cm^2/sec in most moderately moist (nonsaturated) and microbially active soils. D_s values within this range are used for the computation of radial oxygen concentration profiles. Assuming that ρ_p and ρ_{water} are constant, a family of curves as a function of D_s (affected by moisture content) and r can be plotted as shown in Figures A-1 and A-2.

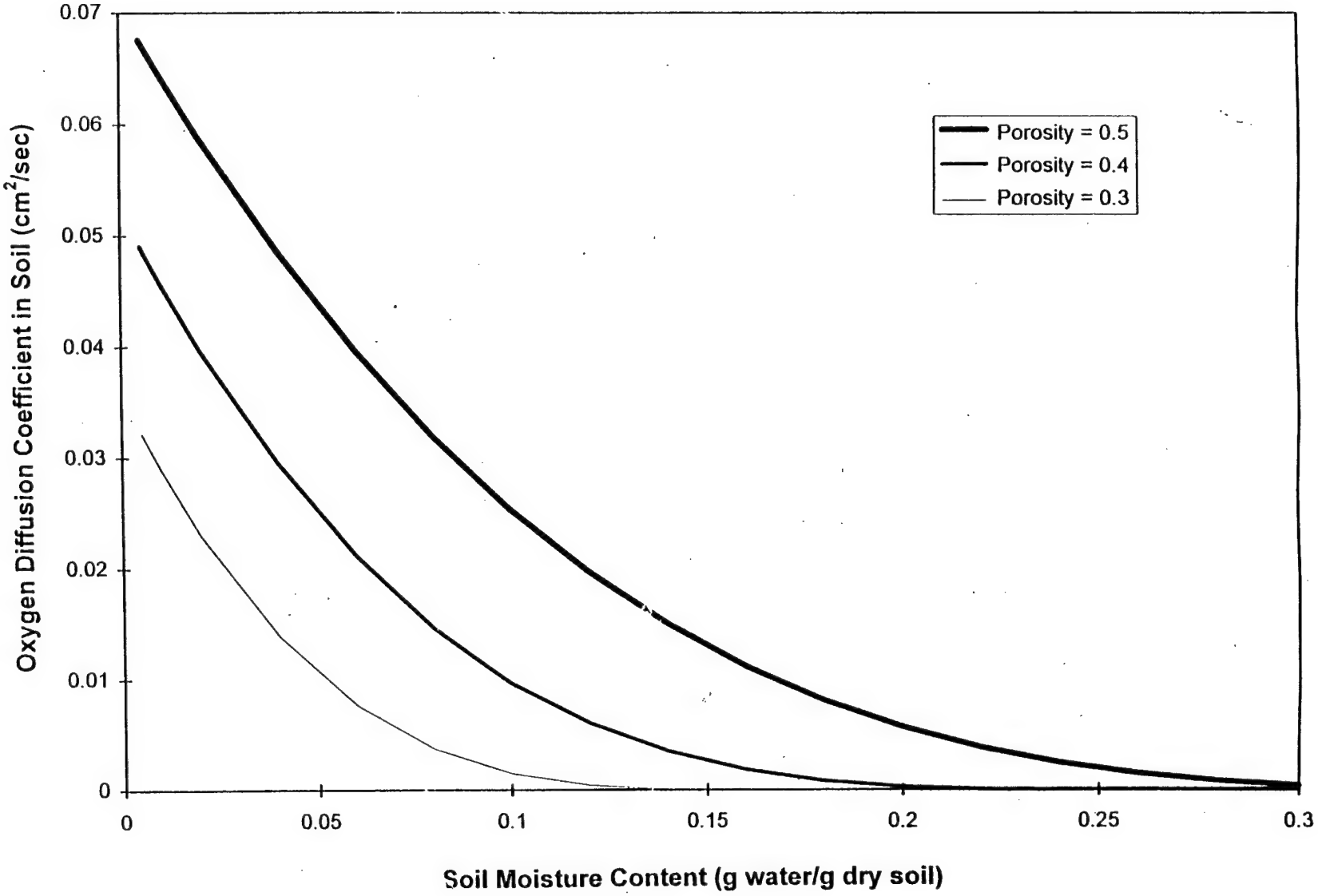

Figure A-1. Oxygen Diffusion Coefficient vs. Soil Moisture Content

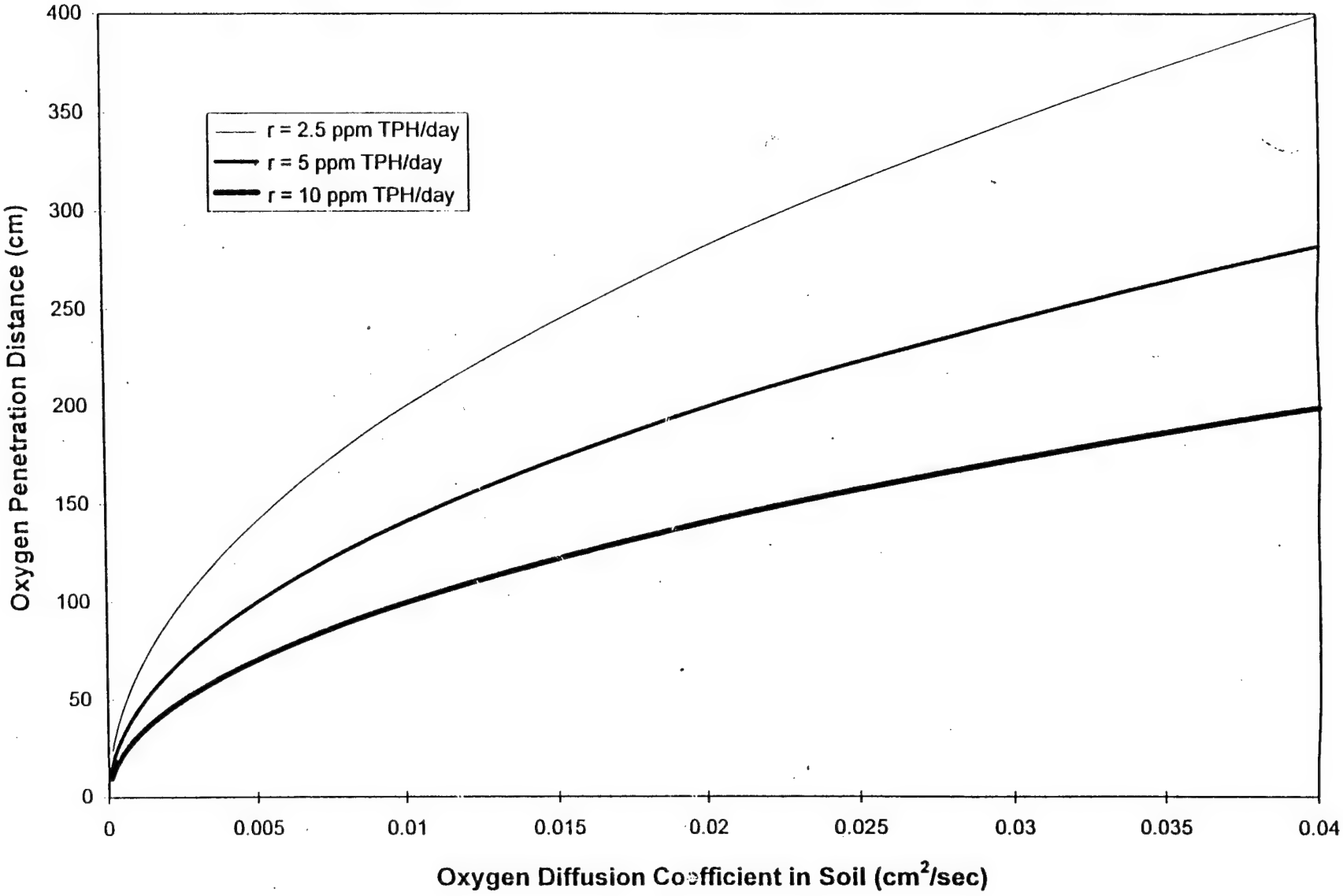

Figure A-2. Oxygen Diffusion Coefficient in Soil vs. Oxygen Penetration Distance as a Function of Rate of Oxygen Consumption (r)

APPENDIX B

DAILY GROUNDWATER EXTRACTION DATA

GROUNDWATER EXTRACTION DATA

Daily and cummulative groundwater extraction volumes.

Date	Time	H20 Meter, gal	Cummulative, gal	Comment
21-Nov-95	8:25	14783	0	BEGIN MONITORING.
22-Nov-95	7:55	25014	10231	
27-Nov	10:15	26783	12000	
28-Nov-95	9:18	35881	21098	
29-Nov	7:40	37576	22793	
1-Dec-95	8:12	est. 12000	34793	
5-Dec-95		57465	54682	METER BAD FROM 11/30. NEW METER INSTALLED, 00000.
12-Dec-95	16:30	13240	67922	
13-Dec-95	7:50	24605	79287	
14-Dec-95	8:32	40688	95370	
15-Dec-95	8:47	54608	109290	
18-Dec-95	8:15	89540	144222	
19-Dec-95	7:59	101385	156067	
20-Dec-95	8:20	109785	164467	
21-Dec-95	8:43	121950	176632	
25-Jan-96	9:26	122309	176991	
25-Jan-96	15:00	125333	180015	
26-Jan-96	8:00	135064	189746	
29-Jan-96	9:43	170789	225471	
29-Jan-96	15:21	172862	227544	
30-Jan	8:43	182652	237334	
12-Feb-96	8:12	225278	279960	
12-Feb-96	15:11	228818	283500	
13-Feb-96	8:49	238707	293389	
13-Feb-96	14:53	241930	296612	
14-Feb-96	9:04	251397	306079	
14-Feb-96	15:29	254109	308791	
15-Feb-96	13:01	257337	312019	
16-Feb-96	10:04	268063	322745	
16-Feb-96	14:41	270369	325051	
19-Feb-96	7:59	301033	355715	
19-Feb-96	18:10	305222	359904	
20-Feb-96	12:56	310465	365147	
21-Feb-96	9:33	315832	370514	
21-Feb-96	15:56	317268	371950	
22-Feb-96	16:09	322322	377004	
23-Feb-96	8:42	329218	383900	
26-Feb-96	8:12	357142	411824	

26-Feb-96	16:32	359755	414437	
27-Feb-96	9:45	366215	420897	
28-Feb-96	8:38	374671	429353	
29-Feb-96	10:07	384184	438866	
29-Feb-96	15:18	386156	440838	
1-Mar-96	8:21	393967	448649	
5-Mar-96	8:05	405673	460355	
6-Mar-96	14:45	428468	483150	
8-Mar-96	10:04	444831	499513	
11-Mar-96	8:12	470223	524905	
11-Mar-96	15:25	471667	526349	
13-Mar-96	8:23	480544	535226	
15-Mar-96	14:04	492249	546931	
15-Mar-96	16:55	492809	547491	
18-Mar-96	15:05	511665	566347	
27-Mar-96	8:44	511768	566450	
28-Mar-96	8:40	511825	566507	
29-Mar-96	14:12	est. 9460	563967	Pump meter malfunctioning.
1-Apr-96	14:12	est. 7200	571167	Est. at 300 gph
2-Apr-96	14:12	est. 7200	578367	
3-Apr-96	14:40	est. 5100	583467	*approx 7hrs down time.
4-Apr-96	14:40	est. 7200	590667	
5-Apr-96	15:15	est. 7375	598042	new meter installed. 00000.
22-Apr-96	7:57	20573	618615	
22-Apr-96	13:48	27074	625116	
24-Apr-96	8:10	33525	631567	
25-Apr-96	7:15	43479	641521	
25-Apr-96	15:21	49698	647740	
26-Apr-96	7:28	53415	651457	
27-Apr-96	14:54	59576	657618	
30-Apr-96	7:59	67164	665206	
30-Apr-96	14:48	70195	668237	
1-May-96	7:47	76838	674880	
2-May	8:04	87569	685611	
2-May	18:17	92024	690066	
3-May-96	8:04	97284	695326	
3-May-96	14:14	99767	697809	system down 4 MAY 96.
6-May-96	14:10	est. 5700	703509	Meter broke, est. 400 gph
7-May-96	14:10	est. 9600	713109	
8-May-96	14:10	est. 9600	722709	
9-May-96	14:10	est. 9600	732309	
10-May-96	14:10	est. 9600	741909	
21-May-96	11:36	est. 114144	856053	fm 10-21May, On: 11.89 days @400gph, 5 wells
30-May-96	7:30	est. 19116	875169	fm 28-30MAY, On: 1.77 days@450gph, 6 wells

2-Jun-96	12:30	est. 25872	901041	fm 30May-2Jun, On: 3.08 days@350gph, 4 wells
8-Jun-96	13:10	est. 19200	920241	fm 6-8Jun, On: 2days@400ghp,
19-Jun-96	8:30	est. 128304	1048545	fm 8-19Jun, On: 11.88 days@450gph,
26-Jun-96	8:11	4958	1053503	NEW METER INSTALLED 10:10 June 25, 00000.
27-Jun-96	8:09	17096	1065641	
28-Jun-96	8:20	32124	1080669	
1-Jul-96	8:10	est. 39468	1120137	fm 28Jun-1Jul, On: 2.99 days@550gph, 8 wells

Extracted Groundwater Contaminant Data. Analysis was performed by Alpha Analytical, Inc.

Date (m/d/y)	Sample ID	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	TPH-D (ug/L)
	SWT-TT-1					
	SWT-TT-2					
5/7/96	SWT-TT-3	120	5500	14	300	NM
5/7/96	SWT-TT-4	NM	NM	NM	NM	2300
5/9/96	SWT-TT-5	130	5500	13	310	2300
5/9/96	SWT-TT-6	120	5500	13	310	1700
5/15/96	SWT-TT-7	79	5100	ND	300	1800
5/15/96	SWT-TT-8	62	3400	ND	170	2500
5/20/96	SWT-TT-9	68	4700	ND	250	1600
5/20/96	SWT-TT-10	72	4800	ND	220	2200
5/30/96	SWT-TT-11	120	4800	ND	250	3800
5/30/96	SWT-TT-12	120	4700	ND	220	3500
6/7/96	SWT-TT-13	110	5000	ND	250	2100
6/7/96	SWT-TT-14	110	5000	ND	260	1900

ND - Below detection limit.
NM - Not measured.

APPENDIX C

OPERATIONS LOG

OPERATIONS ON/OFF LOG

ON	OFF	Date	Time	Run Time (days)	Cumulative Time (days)	Comment	Extraction Wells Used
X		11/21/95	8:36				
	X	11/21/95	9:07	0.02	0.02	Emissions concern. Voluntary shut down.	
X		11/21/95	10:17				
	X	11/29/95	9:17	8.96	8.98	LRP pump leaking.	
X		11/29/95	11:27			Attempted repair.	
	X	11/29/95	13:15	0.07	9.05	Pump still leaking.	
X		11/29/95	14:48			Attempted repair.	
	X	11/29/95	16:40	0.07	9.12	Drain plug still leaking.	
X		11/30/95	13:00			Repaired.	
	X	12/2/95	12:30	1.97	11.09	System found shut off. Unknown reason.	
X		12/11/95	13:31				
	X	12/12/95	7:40	0.75	11.84	System shut down due to kill switch on water holding tanks.	
X		12/12/95	13:20				
	X	12/21/95	14:35	9.25	21.09	Shut down due to air emissions.	
X		1/25/96	10:00				109,123,124,98,117,+ 110,115,
	X	1/31/96	8:45	5.94	27.03	System shut down due to kill switch on water holding tanks.	
X		2/8/96	9:37				
	X	2/14/96	13:09	6.18	33.21	Unknown reason.	

ON	OFF	Date	Time	Run Time (days)	Cumulative Time (days)	Comment	Extraction Wells Used
X		2/14/96	13:50				
	X	2/15/96	6:35	0.70	33.91	Suspected tampering.	
X		2/15/96	6:36				117,118,100,98,115,109, +110,102,124, 116,113,122,105
	X	2/19/96	16:25	4.41	38.32	Leak around old repair.	
X		2/19/96	17:05				
	X	2/22/96	10:06	2.70	41.02	Part replacement.	
X		2/22/96	15:57				
	X	3/3/96	21:00	10.24	51.26	System shut down due to product tank kill switch.	
X		3/5/96	10:23				98,100,123,118,119,117,116,113,110,109,122,105,
	X	3/12/96	10:41	7.01	58.27	Recirculation line blocked.	
X		3/12/96	11:10				100,123,98,114,118,117,119,99
		3/13/96		3.13	61.40	Amperage problems, system down approximately 3 to 5 hours during day.	100,123,117,119,118,
	X	3/15/96	14:17			Surge tank installation.	
X		3/15/96	14:54				100,98,118,119,117,123,114,99
	X	3/18/96	15:44	3.04	64.44	Respiration test.	
X		3/27/96	8:44				100,123,118,119,117,
	X	4/3/96	7:40	6.96	71.40	System shut down due to product tank kill switch.	
X		4/3/96	13:26				100,123,117,118,119,

ON	OFF	Date	Time	Run Time (days)	Cumulative Time (days)	Comment	Extraction Wells Used
	X	4/5/96	15:03	2.07	73.46	Installed FET.	
X		4/5/96	15:25				100,123,119,118,
	X	4/5/96	17:10	0.07	73.54	Recirculation problem.	
X		4/8/96	13:10				100,119,105,113,
	X	4/9/96	6:57	0.74	74.28	Pumphead broken.	
X		4/19/96	7:40				100,123,113,105,
	X	4/26/96	15:12	7.31	81.59	Limited site access for the weekend.	
X		4/29/96	7:23				100,123,113,105,98,
	X	5/4/96	9:00	5.07	86.66	System shut down due to product tank kill switch.	
X		5/6/96	14:10				100,123,113,105,98,
	X	5/21/96	11:36	14.88	101.53	OEMS Respiration test.	
X		5/28/96	10:11				
	X	5/28/96	13:10	0.13	101.66	Product tank kill switch activated.	
X		5/28/96	14:20				
	X	5/29/96	7:30	0.71	102.37	Product tank kill switch activated.	
X		5/29/96	9:17				
	X	5/30/96	~08:00	0.96	103.32	Product tank kill switch activated.	
X		5/30/96	10:39				
	X	6/2/96	~8:00	2.94	106.26	Unknown reason - System found running dry.	

ON	OFF	Date	Time	Run Time (days)	Cumulative Time (days)	Comment	Extraction Wells Used
X		6/6/96	13:10				100,123,119,105,98,+99,3144,sump
	X	6/10/96	12:40	3.96	110.22	Unknown reason	
X		6/10/96	12:47				100,123,119,105,113,98,99,3144,sump
	X	6/11/96	13:07	1.04	111.26	Unknown reason	
X		6/11/96	13:10				
	X	6/19/96	8:30	7.79	119.05	Respiration test	
X		6/25/96	10:10				100,123,105,113,98,119,3144,sump
	X	6/28/96	2:00	3.17	122.22	Unknown reason	
X		6/28/96	8:14				100,123,119,113,105,sump,3144

APPENDIX D

GROUNDWATER LEVEL DATA

PRESSURE TRANSDUCER GROUNDWATER-LEVEL MEASUREMENTS

Values in elevation above mean sea level.

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
323	0240	1252.84	1252.92	1252.91	1252.63	1253.15	1252.89	1252.70
323	0430	1252.86	1252.94	1252.93	1252.65	1253.17	1252.91	1252.72
323	0620	1252.85	1252.93	1252.91	1252.64	1253.16	1252.90	1252.71
323	2150	1252.83	1252.91	1252.90	1252.62	1253.14	1252.88	1252.70
324	0000	1252.80	1252.88	1252.86	1252.59	1253.11	1252.85	1252.67
324	0600	1252.74	1252.82	1252.81	1252.52	1253.05	1252.79	1252.60
324	1200	1252.66	1252.74	1252.73	1252.44	1252.96	1252.70	1252.51
324	1800	1252.65	1252.73	1252.71	1252.42	1252.98	1252.69	1252.50
325	0000	1252.57	1252.64	1252.62	1252.34	1252.88	1252.60	1252.41
325	0600	1252.58	1252.67	1252.63	1252.34	1252.88	1252.60	1252.42
325	1200	1251.84	1252.02	1251.94	1251.58	1251.87	1251.72	1251.88
325	1800	1251.13	1251.15	1251.27	1251.17	1250.97	1251.15	1251.34
326	0000	1250.96	1250.90	1251.07	1251.05	1250.71	1250.98	1251.13
326	0600	1250.99	1250.90	1251.08	1251.12	1250.69	1250.99	1251.16
326	1200	1251.12	1250.95	1251.13	1251.21	1250.79	1251.04	1251.24
326	1800	1251.85	1251.77	1251.87	1251.82	1251.87	1251.80	1251.84
327	0000	1252.01	1251.98	1252.03	1251.94	1252.12	1251.98	1251.97
327	0600	1252.06	1252.06	1252.09	1251.99	1252.22	1252.05	1252.01
327	1200	1252.09	1252.11	1252.12	1252.01	1252.30	1252.08	1252.01
327	1800	1252.16	1252.19	1252.19	1252.08	1252.35	1252.16	1252.08
328	0000	1252.17	1252.21	1252.20	1252.08	1252.36	1252.17	1252.08
328	0600	1252.25	1252.29	1252.28	1252.16	1252.44	1252.25	1252.15
328	1200	1252.34	1252.39	1252.38	1252.25	1252.50	1252.34	1252.23
328	1800	1252.52	1252.56	1252.55	1252.41	1252.68	1252.51	1252.42
328	1920	1252.54	1252.58	1252.56	1252.42	1252.69	1252.53	1252.43
328	2150	1252.74	1252.59	1252.58	1252.44	1252.71	1252.55	1252.46
329	0000	1253.52	1252.62	1252.61	1252.48	1252.75	1252.59	1252.49
329	0240	1252.64	1252.65	1252.64	1252.51	1252.77	1252.62	1252.52
329	0500	1252.60	1252.66	1252.65	1252.51	1252.77	1252.62	1252.53
329	0720	1252.59	1252.65	1252.64	1252.50	1252.77	1252.62	1252.53
329	0950	1252.60	1252.64	1252.63	1252.49	1252.73	1252.61	1252.52
329	1200	1253.28	1252.68	1252.67	1252.52	1252.79	1252.64	1252.54
329	1440	1252.82	1252.75	1252.74	1252.59	1252.85	1252.71	1252.61
329	1700	1252.71	1252.77	1252.77	1252.62	1252.90	1252.74	1252.65
329	1920	1252.72	1252.78	1252.77	1252.63	1252.91	1252.76	1252.66
329	2150	1252.75	1252.80	1252.79	1252.64	1252.92	1252.77	1252.68
330	0000	1252.78	1252.84	1252.84	1252.69	1252.97	1252.82	1252.72
330	0240	1252.90	1252.92	1252.92	1252.77	1253.05	1252.90	1252.81
330	0500	1252.98	1252.98	1252.98	1252.82	1253.11	1252.96	1252.87
330	0720	1253.23	1253.02	1253.03	1252.87	1253.15	1253.01	1252.92
330	0950	1253.81	1253.07	1253.08	1252.92	1253.17	1253.07	1252.97
330	1200	1253.28	1253.17	1253.17	1253.01	1253.31	1253.15	1253.06
330	1440	1253.33	1253.27	1253.29	1253.12	1253.34	1253.26	1253.17
330	1700	1253.43	1253.31	1253.32	1253.16	1253.43	1253.32	1253.23
330	1920	1253.36	1253.35	1253.37	1253.20	1253.47	1253.36	1253.28
330	2150	1253.44	1253.34	1253.36	1253.19	1253.46	1253.36	1253.28
331	0000	1253.25	1253.32	1253.35	1253.17	1253.47	1253.36	1253.27
331	0240	1253.33	1253.17	1253.21	1253.03	1253.33	1253.22	1253.16

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
331	0500	1252.99	1253.04	1253.08	1252.90	1253.22	1253.09	1253.03
331	0720	1252.87	1252.93	1252.97	1252.79	1253.12	1252.99	1252.92
331	0950	1252.74	1252.80	1252.80	1252.52	1252.94	1252.71	1252.74
331	1200	1251.68	1251.85	1251.93	1251.92	1251.81	1251.92	1252.16
331	1440	1251.23	1251.28	1251.46	1251.57	1251.20	1251.47	1251.79
331	1700	1250.99	1250.97	1251.20	1251.37	1250.91	1251.22	1251.55
331	1920	1250.76	1250.69	1250.94	1251.16	1250.63	1250.98	1251.32
331	2150	1250.59	1250.50	1250.77	1251.01	1250.46	1250.80	1251.14
332	0000	1250.48	1250.37	1250.64	1250.91	1250.33	1250.69	1251.04
332	0240	1250.41	1250.29	1250.57	1250.86	1250.26	1250.58	1250.93
332	0500	1250.33	1250.19	1250.47	1250.79	1250.19	1250.52	1250.84
332	0720	1250.29	1250.16	1250.43	1250.76	1250.17	1250.45	1250.79
332	0950	1250.26	1250.13	1250.39	1250.74	1250.17	1250.41	1250.74
332	1200	1250.31	1250.16	1250.41	1250.79	1250.20	1250.33	1250.78
332	1440	1250.27	1250.11	1250.35	1250.75	1250.04	1250.22	1250.79
332	1700	1250.20	1250.03	1250.27	1250.68	1249.94	1250.11	1250.71
332	1920	1250.11	1249.94	1250.17	1250.60	1249.78	1250.00	1250.62
332	2150	1250.06	1249.88	1250.11	1250.55	1249.76	1249.91	1250.54
333	0000	1250.05	1249.85	1250.09	1250.51	1249.74	1249.84	1250.49
333	0240	1250.03	1249.84	1250.06	1250.49	1249.73	1249.79	1250.45
333	0500	1250.03	1249.83	1250.04	1250.47	1249.73	1249.66	1250.43
333	0720	1249.98	1249.78	1249.96	1250.36	1249.68	1249.26	1250.33
333	0950	1250.23	1249.98	1250.00	1250.26	1249.79	1248.57	1250.25
333	1200	1250.07	1249.89	1249.84	1250.13	1249.54	1248.00	1250.20
333	1500	1250.13	1249.91	1249.59	1249.79	1249.17	1247.47	1250.01
333	1530	1250.18	1249.94	1249.58	1249.79	1248.63	1247.57	1250.00
333	1600	1250.12	1249.94	1249.49	1249.67	1249.01	1247.28	1249.95
333	1630	1250.34	1250.09	1249.74	1249.89	1249.24	1248.02	1250.03
333	1700	1250.62	1250.14	1249.89	1249.96	1249.36	1248.60	1250.06
333	1730	1250.67	1250.21	1249.91	1250.04	1248.96	1248.67	1250.12
333	1800	1250.62	1250.30	1250.05	1250.15	1249.41	1249.05	1250.19
333	1830	1250.65	1250.38	1250.19	1250.26	1249.73	1249.34	1250.26
333	1900	1250.96	1250.47	1250.31	1250.37	1249.99	1249.59	1250.34
333	1930	1250.74	1250.55	1250.42	1250.47	1250.19	1249.79	1250.41
333	2000	1250.82	1250.63	1250.53	1250.55	1250.37	1249.97	1250.48
333	2030	1250.90	1250.72	1250.62	1250.65	1250.53	1250.12	1250.55
333	2100	1250.96	1250.80	1250.72	1250.74	1250.66	1250.27	1250.62
333	2130	1251.03	1250.87	1250.80	1250.82	1250.78	1250.39	1250.69
333	2200	1251.09	1250.94	1250.88	1250.89	1250.90	1250.51	1250.75
333	2230	1251.16	1251.01	1250.96	1250.96	1251.00	1250.62	1250.81
333	2300	1251.21	1251.07	1251.03	1251.03	1251.09	1250.72	1250.87
333	2330	1251.26	1251.13	1251.09	1251.09	1251.16	1250.80	1250.93
334	0000	1251.31	1251.19	1251.15	1251.16	1251.23	1250.89	1250.98
334	0030	1251.36	1251.25	1251.21	1251.21	1251.30	1250.97	1251.04
334	0100	1251.40	1251.30	1251.26	1251.27	1251.37	1251.04	1251.09
334	0130	1251.44	1251.35	1251.32	1251.32	1251.42	1251.10	1251.14
334	0200	1251.49	1251.39	1251.36	1251.37	1251.47	1251.15	1251.19
334	0230	1251.52	1251.44	1251.41	1251.41	1251.51	1251.21	1251.23
334	0300	1251.55	1251.48	1251.45	1251.45	1251.56	1251.26	1251.27
334	0330	1251.60	1251.53	1251.49	1251.50	1251.60	1251.31	1251.32
334	0400	1251.62	1251.56	1251.53	1251.53	1251.64	1251.35	1251.36

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
334	0430	1251.66	1251.60	1251.57	1251.58	1251.68	1251.40	1251.40
334	0500	1251.69	1251.64	1251.61	1251.61	1251.71	1251.44	1251.43
334	0530	1251.72	1251.67	1251.64	1251.65	1251.74	1251.48	1251.47
334	0600	1251.73	1251.70	1251.66	1251.67	1251.76	1251.51	1251.50
334	0630	1251.76	1251.72	1251.69	1251.69	1251.78	1251.53	1251.53
334	0700	1251.78	1251.74	1251.72	1251.72	1251.80	1251.56	1251.55
334	0730	1251.80	1251.76	1251.73	1251.74	1251.82	1251.59	1251.58
334	0800	1251.80	1251.78	1251.75	1251.75	1251.83	1251.60	1251.60
334	0830	1251.81	1251.79	1251.76	1251.77	1251.82	1251.62	1251.61
334	0900	1251.83	1251.81	1251.78	1251.79	1251.84	1251.64	1251.64
334	0930	1251.85	1251.83	1251.80	1251.80	1251.85	1251.66	1251.65
334	1000	1251.89	1251.83	1251.80	1251.81	1251.86	1251.67	1251.66
334	1030	1252.08	1251.85	1251.82	1251.83	1251.86	1251.69	1251.68
334	1100	1252.54	1251.88	1251.84	1251.85	1251.89	1251.72	1251.70
334	1130	1251.92	1251.90	1251.88	1251.87	1251.90	1251.74	1251.73
334	1200	1251.96	1251.93	1251.91	1251.91	1251.95	1251.78	1251.76
334	1230	1252.23	1251.97	1251.94	1251.94	1251.99	1251.81	1251.79
334	1300	1252.01	1252.01	1251.98	1251.98	1252.01	1251.84	1251.82
334	1330	1252.06	1252.05	1252.01	1252.02	1252.05	1251.88	1251.85
334	1400	1252.15	1251.93	1251.87	1251.95	1251.65	1251.59	1251.84
334	1430	1252.80	1251.72	1251.36	1251.64	1250.61	1250.39	1251.73
334	1500	1251.53	1251.56	1251.06	1251.38	1250.11	1249.44	1251.62
334	1530	1251.37	1251.40	1250.88	1251.20	1249.78	1248.85	1251.47
334	1600	1251.20	1251.24	1250.73	1251.04	1249.90	1248.44	1251.33
334	1630	1251.24	1251.19	1250.67	1250.97	1250.00	1248.30	1251.19
334	1700	1251.31	1251.04	1250.49	1250.80	1249.40	1248.09	1251.08
334	1730	1251.06	1250.91	1250.37	1250.67	1249.50	1247.83	1250.95
334	1800	1250.89	1250.80	1250.27	1250.55	1249.51	1247.65	1250.81
334	1830	1250.98	1250.70	1250.17	1250.46	1249.47	1247.51	1250.70
334	1900	1250.71	1250.61	1250.08	1250.37	1249.43	1247.39	1250.59
334	1930	1250.72	1250.53	1250.00	1250.28	1249.37	1247.27	1250.49
334	2000	1250.58	1250.45	1249.92	1250.21	1249.32	1247.16	1250.40
334	2030	1250.61	1250.39	1249.85	1250.13	1249.27	1247.07	1250.30
334	2100	1250.73	1250.32	1249.78	1250.07	1249.22	1246.99	1250.24
334	2130	1253.77	1250.27	1249.73	1250.01	1249.19	1246.93	1250.17
334	2200	1250.70	1250.21	1249.66	1249.95	1249.15	1246.87	1250.09
334	2230	1250.36	1250.16	1249.61	1249.90	1249.11	1246.82	1250.03
334	2300	1251.67	1250.11	1249.56	1249.84	1249.07	1246.77	1249.96
334	2330	1251.00	1250.07	1249.52	1249.79	1249.04	1246.73	1249.92
335	0000	1251.48	1250.03	1249.48	1249.76	1249.00	1246.68	1249.86
335	0030	1250.36	1250.00	1249.44	1249.72	1248.98	1246.64	1249.81
335	0100	1250.21	1249.97	1249.41	1249.69	1248.96	1246.60	1249.75
335	0130	1250.29	1249.94	1249.36	1249.51	1248.93	1246.57	1249.74
335	0200	1250.20	1249.90	1249.33	1249.59	1248.89	1246.53	1249.68
335	0230	1250.15	1249.88	1249.28	1249.56	1248.87	1246.49	1249.64
335	0300	1250.14	1249.85	1249.21	1249.50	1248.84	1246.43	1249.60
335	0330	1250.09	1249.81	1249.15	1249.41	1248.82	1246.37	1249.54
335	0400	1250.07	1249.78	1249.11	1249.25	1248.79	1246.34	1249.54
335	0430	1250.05	1249.76	1249.07	1249.17	1248.77	1246.30	1249.49
335	0500	1250.03	1249.73	1249.03	1249.30	1248.74	1246.26	1249.45
335	0530	1250.00	1249.69	1249.00	1249.24	1248.71	1246.22	1249.41

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
335	0600	1249.97	1249.65	1248.95	1249.19	1248.68	1246.18	1249.37
335	0630	1249.94	1249.62	1248.89	1249.15	1248.65	1246.13	1249.32
335	0700	1249.90	1249.58	1248.85	1249.00	1248.60	1246.08	1249.27
335	0730	1249.87	1249.54	1248.81	1249.01	1248.56	1246.02	1249.22
335	0800	1249.84	1249.51	1248.77	1249.00	1248.53	1245.99	1249.16
335	0830	1249.81	1249.48	1248.75	1248.87	1248.49	1245.97	1249.13
335	0900	1249.82	1249.47	1248.72	1248.91	1248.48	1245.95	1249.11
335	0930	1249.79	1249.44	1248.70	1248.82	1248.44	1245.94	1249.08
335	1000	1249.95	1249.41	1248.67	1248.82	1248.41	1245.92	1249.05
335	1030	1249.75	1249.40	1248.64	1248.85	1248.40	1245.89	1249.02
335	1100	1250.26	1249.39	1248.63	1248.86	1248.39	1245.89	1249.00
335	1130	1249.76	1249.37	1248.62	1248.74	1248.38	1245.88	1248.98
335	1200	1249.77	1249.37	1248.61	1248.77	1248.37	1245.88	1248.97
335	1230	1249.72	1249.37	1248.60	1248.80	1248.36	1245.87	1248.97
335	1300	1249.75	1249.36	1248.59	1248.76	1248.36	1245.87	1248.97
335	1330	1249.76	1249.35	1248.59	1248.74	1248.37	1245.87	1248.95
335	1400	1249.97	1249.35	1248.58	1248.66	1248.37	1245.83	1248.93
335	1430	1249.77	1249.35	1248.57	1248.73	1248.36	1245.80	1248.93
335	1500	1250.58	1249.34	1248.56	1248.81	1248.36	1245.78	1248.91
335	1530	1249.76	1249.32	1248.53	1248.78	1248.35	1245.76	1248.89
335	1600	1249.82	1249.31	1248.51	1248.61	1248.33	1245.75	1248.87
335	1630	1249.67	1249.29	1248.49	1248.66	1248.33	1245.74	1248.84
335	1700	1249.81	1249.28	1248.48	1248.70	1248.33	1245.72	1248.84
335	1730	1249.71	1248.26	1248.46	1248.70	1248.28	1245.70	1248.82
335	1800	1249.62	1249.24	1248.43	1248.56	1248.26	1245.69	1248.79
335	1830	1249.63	1249.23	1248.41	1248.63	1248.24	1245.67	1248.77
335	1900	1249.59	1249.21	1248.39	1248.51	1248.22	1245.64	1248.72
335	1930	1249.59	1249.20	1248.37	1248.58	1248.21	1245.62	1248.70
335	2000	1249.63	1249.19	1248.36	1248.54	1248.19	1245.61	1248.68
335	2030	1249.62	1249.18	1248.34	1248.46	1248.18	1245.59	1248.66
335	2100	1249.58	1249.16	1248.33	1248.37	1248.17	1245.58	1248.64
335	2130	1249.87	1249.15	1248.30	1248.50	1248.16	1245.56	1248.61
335	2200	1249.86	1249.14	1248.29	1248.47	1248.14	1245.55	1248.59
335	2230	1250.28	1249.13	1248.27	1248.44	1248.13	1245.54	1248.58
335	2300	1250.40	1249.12	1248.27	1248.41	1248.12	1245.53	1248.57
335	2330	1249.52	1249.12	1248.27	1248.36	1248.12	1245.52	1248.54
336	0000	1249.54	1249.12	1248.26	1248.33	1248.12	1245.51	1248.50
336	0030	1249.69	1249.12	1248.26	1248.32	1248.11	1245.50	1248.48
336	0100	1249.70	1249.12	1248.26	1248.29	1248.11	1245.50	1248.49
336	0130	1251.16	1249.12	1248.26	1248.30	1248.10	1245.49	1248.45
336	0200	1250.17	1249.12	1248.26	1248.29	1248.10	1245.49	1248.45
336	0230	1250.43	1249.12	1248.26	1248.25	1248.10	1245.48	1248.45
336	0300	1249.52	1249.12	1248.26	1248.29	1248.10	1245.48	1248.40
336	0330	1249.82	1249.13	1248.26	1248.27	1248.09	1245.47	1248.40
336	0400	1249.59	1249.14	1248.26	1248.44	1248.11	1245.49	1248.41
336	0430	1249.55	1249.14	1248.27	1248.39	1248.10	1245.50	1248.38
336	0500	1249.54	1249.12	1248.26	1248.29	1248.09	1245.49	1248.37
336	0530	1249.55	1249.12	1248.25	1248.39	1248.09	1245.48	1248.36
336	0600	1249.54	1249.12	1248.25	1248.35	1248.07	1245.48	1248.34
336	0630	1250.44	1249.11	1248.24	1248.43	1248.06	1245.47	1248.31
336	0700	1249.69	1249.09	1248.23	1248.39	1248.05	1245.47	1248.30

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
336	0730	1250.65	1249.09	1248.22	1248.29	1248.05	1245.46	1248.26
336	0800	1249.73	1249.08	1248.21	1248.38	1248.04	1245.43	1248.24
336	0830	1249.73	1249.08	1248.21	1248.32	1248.02	1245.42	1248.21
336	0900	1249.69	1249.07	1248.20	1248.28	1248.01	1245.40	1248.21
336	0930	1249.53	1249.07	1248.19	1248.35	1248.00	1245.39	1248.15
336	1000	1250.30	1249.29	1248.49	1248.59	1248.14	1246.18	1248.35
336	1030	1249.95	1249.37	1248.68	1248.75	1248.33	1246.88	1248.49
336	1100	1249.94	1249.47	1248.86	1248.95	1248.57	1247.37	1248.65
336	1130	1250.70	1249.59	1249.05	1249.13	1248.81	1247.75	1248.80
336	1200	1250.23	1249.72	1249.23	1249.33	1249.06	1248.07	1248.97
336	1230	1250.23	1249.85	1249.40	1249.50	1249.27	1248.35	1249.13
336	1300	1250.39	1249.97	1249.56	1249.67	1249.47	1248.60	1249.28
336	1330	1250.47	1250.08	1249.70	1249.81	1249.64	1248.80	1249.42
336	1400	1251.61	1250.18	1249.84	1249.95	1249.81	1249.00	1249.54
336	1430	1250.96	1250.29	1249.96	1250.08	1249.99	1249.17	1249.66
336	1500	1250.79	1250.38	1250.07	1250.19	1250.12	1249.33	1249.77
336	1530	1250.88	1250.45	1250.17	1250.30	1250.25	1249.46	1249.87
336	1600	1251.27	1250.53	1250.26	1250.39	1250.36	1249.59	1249.95
336	1630	1250.98	1250.61	1250.35	1250.47	1250.48	1249.72	1250.04
336	1700	1251.32	1250.66	1250.42	1250.55	1250.57	1249.82	1250.11
336	1730	1251.49	1250.73	1250.50	1250.63	1250.63	1249.92	1250.18
336	1800	1250.99	1250.78	1250.56	1250.70	1250.68	1250.01	1250.25
336	1830	1251.08	1250.84	1250.63	1250.78	1250.76	1250.11	1250.31
336	1900	1251.13	1250.88	1250.69	1250.83	1250.82	1250.20	1250.36
336	1930	1251.13	1250.93	1250.74	1250.89	1250.88	1250.28	1250.43
336	2000	1251.16	1250.97	1250.79	1250.95	1250.95	1250.36	1250.49
336	2030	1251.18	1251.01	1250.84	1251.00	1250.98	1250.44	1250.54
336	2100	1251.61	1251.06	1250.89	1251.06	1251.03	1250.51	1250.60
336	2130	1253.12	1251.09	1250.93	1251.11	1251.07	1250.57	1250.65
336	2200	1251.26	1251.12	1250.98	1251.15	1251.12	1250.63	1250.70
336	2230	1251.40	1251.15	1251.00	1251.18	1251.16	1250.68	1250.74
336	2300	1251.30	1251.17	1251.04	1251.22	1251.17	1250.72	1250.78
336	2330	1251.33	1251.20	1251.07	1251.25	1251.21	1250.77	1250.81
337	0000	1251.36	1251.22	1251.09	1251.29	1251.22	1250.81	1250.85
337	0600	1251.47	1251.40	1251.31	1251.52	1251.44	1251.11	1251.12
337	1200	1251.49	1251.45	1251.37	1251.59	1251.51	1251.22	1251.20
337	1800	1251.61	1251.54	1251.47	1251.68	1251.62	1251.34	1251.31
338	0000	1251.63	1251.62	1251.54	1251.74	1251.68	1251.42	1251.38
338	0600	1251.82	1251.81	1251.74	1251.92	1251.84	1251.61	1251.58
338	1200	1252.26	1252.00	1251.93	1252.09	1251.99	1251.79	1251.76
338	1800	1252.43	1252.25	1252.18	1252.33	1252.21	1252.03	1252.02
339	0000	1252.27	1252.28	1252.21	1252.34	1252.23	1252.07	1252.07
339	0600	1252.18	1252.19	1252.14	1252.26	1252.16	1252.00	1252.01
339	1200	1251.95	1251.93	1251.89	1252.02	1251.94	1251.76	1251.76
340	0000	1252.02	1252.04	1251.98	1252.08	1252.07	1251.89	1251.84
340	1200	1252.29	1252.26	1252.21	1252.28	1252.28	1252.11	1252.07
341	0000	1252.06	1252.10	1252.05	1252.11	1252.13	1251.96	1251.92
341	1200	1252.12	1252.16	1252.10	1252.14	1252.22	1252.03	1251.96
342	0000	1252.41	1252.45	1252.39	1252.41	1252.45	1252.31	1252.25
342	1200	1252.37	1252.40	1252.36	1252.36	1252.40	1252.28	1252.24
343	0000	1251.91	1251.96	1251.92	1251.91	1252.08	1251.87	1251.80

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
343	1200	1251.89	1251.95	1251.89	1251.87	1252.05	1251.85	1251.74
344	0000	1252.00	1252.06	1251.99	1251.94	1252.15	1251.93	1251.83
344	1200	1252.21	1252.27	1252.20	1252.14	1252.30	1252.13	1252.02
345	0000	1252.38	1252.44	1252.37	1252.30	1252.44	1252.30	1252.22
345	0030	1252.39	1252.45	1252.39	1252.31	1252.45	1252.31	1252.23
345	0100	1252.40	1252.47	1252.40	1252.33	1252.46	1252.32	1252.24
345	0130	1252.41	1252.48	1252.41	1252.34	1252.47	1252.33	1252.25
345	0200	1252.42	1252.49	1252.41	1252.34	1252.48	1252.34	1252.26
345	0230	1252.43	1252.49	1252.43	1252.36	1252.49	1252.35	1252.27
345	0300	1252.44	1252.50	1252.44	1252.37	1252.50	1252.36	1252.29
345	0330	1252.45	1252.51	1252.44	1252.38	1252.51	1252.37	1252.30
345	0400	1252.46	1252.52	1252.45	1252.38	1252.52	1252.38	1252.31
345	0430	1252.47	1252.53	1252.46	1252.39	1252.53	1252.39	1252.31
345	0500	1252.47	1252.53	1252.46	1252.39	1252.53	1252.39	1252.32
345	0530	1252.47	1252.53	1252.46	1252.39	1252.52	1252.39	1252.32
345	0600	1252.48	1252.53	1252.47	1252.39	1252.53	1252.39	1252.33
345	0630	1252.49	1252.54	1252.48	1252.41	1252.54	1252.40	1252.34
345	0700	1252.49	1252.55	1252.49	1252.42	1252.54	1252.41	1252.34
345	0730	1252.50	1252.56	1252.49	1252.42	1252.54	1252.42	1252.35
345	0800	1252.50	1252.56	1252.49	1252.42	1252.54	1252.42	1252.35
345	0830	1252.50	1252.56	1252.50	1252.43	1252.53	1252.42	1252.36
345	0900	1252.50	1252.56	1252.50	1252.42	1252.53	1252.42	1252.36
345	0930	1252.49	1252.54	1252.48	1252.41	1252.52	1252.41	1252.35
345	1000	1252.41	1252.41	1252.40	1252.08	1252.39	1252.42	1252.51
345	1030	1252.40	1252.45	1252.42	1252.34	1252.34	1252.35	1252.33
345	1100	1252.43	1252.48	1252.45	1252.39	1252.40	1252.38	1252.35
345	1130	1252.45	1252.51	1252.47	1252.41	1252.44	1252.39	1252.36
345	1200	1252.49	1252.53	1252.50	1252.44	1252.49	1252.42	1252.39
345	1230	1252.51	1252.56	1252.52	1252.47	1252.52	1252.45	1252.41
345	1300	1252.54	1252.59	1252.55	1252.50	1252.57	1252.48	1252.44
345	1330	1252.61	1252.61	1252.57	1252.52	1252.59	1252.50	1252.45
345	1400	1252.64	1252.48	1252.24	1252.39	1251.91	1252.15	1252.42
345	1430	1252.20	1252.23	1251.82	1252.15	1251.22	1251.72	1252.30
345	1500	1251.89	1251.95	1251.47	1251.87	1250.56	1251.24	1252.15
345	1530	1251.64	1251.71	1251.28	1251.73	1250.08	1250.93	1252.00
345	1600	1251.45	1251.53	1251.13	1251.61	1249.72	1250.72	1251.83
345	1630	1251.30	1251.36	1251.00	1251.51	1249.42	1250.54	1251.69
345	1700	1251.15	1251.20	1250.86	1251.41	1249.17	1250.37	1251.57
345	1730	1251.04	1251.07	1250.74	1251.33	1248.93	1250.22	1251.43
345	1800	1250.93	1250.94	1250.64	1251.20	1248.72	1250.09	1251.28
345	1830	1250.79	1250.80	1250.51	1251.11	1248.52	1249.94	1251.21
345	1900	1250.71	1250.69	1250.39	1251.00	1248.37	1249.42	1251.09
345	1930	1250.64	1250.60	1250.29	1250.90	1248.24	1248.97	1251.00
345	2000	1250.57	1250.52	1250.20	1250.80	1248.12	1248.71	1250.87
345	2030	1250.50	1250.43	1250.10	1250.70	1247.99	1248.31	1250.79
345	2100	1250.44	1250.35	1250.00	1250.58	1247.88	1247.93	1250.70
345	2130	1250.39	1250.29	1249.92	1250.48	1247.79	1247.70	1250.60
345	2200	1250.34	1250.23	1249.83	1250.38	1247.70	1247.45	1250.49
345	2230	1250.27	1250.16	1249.74	1250.26	1247.61	1247.29	1250.35
345	2300	1250.22	1250.09	1249.67	1250.16	1247.51	1247.13	1250.28
345	2330	1250.18	1250.04	1249.60	1250.08	1247.45	1247.00	1250.18

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
346	0000	1250.14	1249.99	1249.54	1250.00	1247.37	1246.88	1250.10
346	0030	1250.11	1249.96	1249.50	1249.95	1247.32	1246.79	1250.02
346	0100	1250.10	1249.93	1249.46	1249.91	1247.28	1246.72	1249.96
346	0130	1250.06	1249.89	1249.41	1249.85	1247.23	1246.65	1249.91
346	0200	1250.01	1249.83	1249.35	1249.77	1247.16	1246.56	1249.83
346	0230	1249.97	1249.78	1249.29	1249.72	1247.09	1246.48	1249.75
346	0300	1249.92	1249.73	1249.23	1249.65	1247.02	1246.41	1249.70
346	0330	1249.90	1249.71	1249.20	1249.62	1246.99	1246.37	1249.65
346	0400	1249.87	1249.67	1249.16	1249.57	1246.94	1246.31	1249.59
346	0430	1249.84	1249.63	1249.11	1249.52	1246.90	1246.25	1249.55
346	0500	1249.80	1249.59	1249.07	1249.47	1246.85	1246.20	1249.47
346	0530	1249.79	1249.58	1249.05	1249.45	1246.80	1246.17	1249.42
346	0600	1249.75	1249.53	1249.00	1249.40	1246.77	1246.11	1249.40
346	0630	1250.01	1249.79	1249.28	1249.55	1247.22	1246.98	1249.53
346	0700	1250.07	1249.85	1249.44	1249.68	1247.64	1247.68	1249.64
346	0730	1250.18	1249.97	1249.62	1249.83	1248.10	1248.15	1249.77
346	0800	1250.25	1250.04	1249.74	1249.93	1248.45	1248.50	1249.88
346	0830	1250.35	1250.16	1249.89	1250.05	1248.76	1248.80	1249.99
346	0900	1250.45	1250.26	1250.03	1250.17	1249.04	1249.05	1250.09
346	0930	1250.55	1250.36	1250.15	1250.29	1249.30	1249.27	1250.19
346	1000	1250.65	1250.47	1250.29	1250.40	1249.55	1249.48	1250.29
346	1030	1250.75	1250.58	1250.42	1250.52	1249.82	1249.68	1250.38
346	1100	1250.83	1250.67	1250.52	1250.62	1250.00	1249.85	1250.47
346	1130	1250.94	1250.79	1250.65	1250.73	1250.19	1250.03	1250.57
346	1200	1251.03	1250.89	1250.76	1250.83	1250.36	1250.19	1250.66
346	1230	1251.12	1250.99	1250.87	1250.94	1250.53	1250.34	1250.76
346	1300	1251.19	1251.07	1250.96	1251.03	1250.65	1250.48	1250.83
346	1330	1251.22	1251.04	1250.96	1251.04	1250.06	1250.47	1250.86
346	1400	1250.98	1250.85	1250.54	1250.81	1247.68	1249.29	1250.76
346	1430	1250.79	1250.71	1250.28	1250.64	1246.49	1248.41	1250.65
346	1500	1250.61	1250.55	1250.11	1250.48	1245.85	1247.98	1250.44
346	1530	1250.47	1250.43	1249.97	1250.36	1245.55	1247.79	1250.27
346	1600	1250.35	1250.32	1249.85	1250.19	1245.24	1247.61	1250.12
346	1630	1250.25	1250.22	1249.75	1250.14	1245.10	1247.46	1249.98
346	1700	1250.15	1250.11	1249.64	1250.04	1244.88	1247.31	1249.86
346	1730	1250.05	1250.01	1249.53	1249.95	1244.70	1247.16	1249.74
346	1800	1249.98	1249.92	1249.45	1249.86	1244.54	1247.04	1249.65
346	1830	1249.91	1249.85	1249.38	1249.79	1244.43	1246.94	1249.57
346	1900	1249.86	1249.78	1249.32	1249.73	1244.35	1246.86	1249.47
346	1930	1249.80	1249.73	1249.27	1249.67	1244.25	1246.78	1249.40
346	2000	1249.74	1249.65	1249.19	1249.60	1244.14	1246.69	1249.33
346	2030	1249.70	1249.60	1249.15	1249.55	1244.08	1246.63	1249.25
346	2100	1249.66	1249.55	1249.10	1249.51	1244.01	1246.59	1249.23
346	2130	1249.62	1249.51	1249.06	1249.46	1243.95	1246.52	1249.16
346	2200	1249.58	1249.46	1249.02	1249.42	1243.89	1246.48	1249.11
346	2230	1249.56	1249.43	1248.99	1249.39	1243.85	1246.43	1249.08
346	2300	1249.53	1249.40	1248.95	1249.36	1243.81	1246.40	1249.04
346	2330	1249.52	1249.38	1248.87	1249.30	1243.81	1246.35	1249.02
347	0000	1249.51	1249.36	1248.81	1249.25	1243.79	1246.27	1248.97
347	0030	1249.49	1249.33	1248.77	1249.21	1243.76	1246.21	1248.94
347	0100	1249.45	1249.29	1248.73	1249.15	1243.73	1246.16	1248.90

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
347	0130	1249.44	1249.27	1248.69	1249.12	1243.71	1246.13	1248.86
347	0200	1249.43	1249.25	1248.67	1249.10	1243.68	1246.09	1248.85
347	0230	1249.41	1249.24	1248.64	1249.07	1243.66	1246.06	1248.83
347	0300	1249.38	1249.20	1248.61	1249.04	1243.63	1246.03	1248.79
347	0330	1249.36	1249.17	1248.57	1249.00	1243.61	1246.01	1248.74
347	0400	1249.33	1249.14	1248.54	1248.96	1243.58	1245.98	1248.73
347	0430	1249.31	1249.12	1248.51	1248.95	1243.56	1245.94	1248.70
347	0500	1249.30	1249.09	1248.50	1248.92	1243.54	1245.91	1248.68
347	0530	1249.27	1249.07	1248.47	1248.90	1243.45	1245.90	1248.67
347	0600	1249.24	1249.04	1248.44	1248.88	1243.21	1245.88	1248.64
347	0630	1249.22	1249.02	1248.42	1248.86	1243.07	1245.88	1248.65
347	0700	1249.17	1248.97	1248.37	1248.83	1242.95	1245.82	1248.61
347	0730	1249.13	1248.94	1248.34	1248.79	1242.83	1245.79	1248.57
347	0800	1249.10	1248.91	1248.31	1248.77	1242.73	1245.75	1248.55
347	0830	1249.09	1248.90	1248.30	1248.77	1242.68	1245.73	1248.54
347	0900	1249.05	1248.87	1248.27	1248.74	1242.59	1245.69	1248.51
347	0930	1249.10	1248.83	1248.24	1248.71	1242.56	1245.64	1248.48
347	1000	1249.04	1248.81	1248.21	1248.69	1242.50	1245.63	1248.45
347	1030	1249.07	1248.79	1248.20	1248.68	1242.46	1245.60	1248.45
347	1100	1249.48	1248.77	1248.16	1248.66	1242.43	1245.58	1248.42
347	1130	1248.95	1248.76	1248.17	1248.70	1242.44	1246.09	1248.46
347	1200	1249.07	1248.74	1248.16	1248.76	1242.31	1246.39	1248.49
347	1230	1248.91	1248.73	1248.17	1248.81	1242.28	1246.55	1248.49
347	1300	1248.90	1248.71	1248.16	1248.84	1242.24	1246.65	1248.51
347	1330	1249.06	1248.70	1248.16	1248.87	1242.23	1246.71	1248.51
347	1400	1248.89	1248.68	1248.15	1248.88	1242.19	1246.75	1248.51
347	1430	1248.87	1248.67	1248.16	1248.91	1242.18	1246.77	1248.52
347	1500	1248.85	1248.65	1248.14	1248.90	1242.19	1246.78	1248.51
347	1530	1248.81	1248.63	1248.12	1248.90	1242.17	1246.79	1248.50
347	1600	1248.79	1248.61	1248.11	1248.90	1242.17	1246.79	1248.47
347	1630	1248.77	1248.59	1248.08	1248.89	1242.14	1246.76	1248.46
347	1700	1248.77	1248.56	1248.06	1248.87	1242.14	1246.75	1248.42
347	1730	1248.79	1248.53	1248.03	1248.86	1242.10	1246.74	1248.40
347	1800	1248.69	1248.51	1248.00	1248.84	1242.07	1246.73	1248.38
347	1830	1248.70	1248.49	1247.99	1248.82	1242.07	1246.71	1248.35
347	1900	1248.64	1248.47	1247.96	1248.81	1242.06	1246.68	1248.32
347	1930	1248.62	1248.44	1247.93	1248.78	1242.05	1246.66	1248.29
347	2000	1248.64	1248.42	1247.91	1248.76	1242.03	1246.64	1248.26
347	2030	1248.60	1248.40	1247.89	1248.74	1242.03	1246.61	1248.22
347	2100	1248.55	1248.38	1247.86	1248.72	1242.01	1246.59	1248.20
347	2130	1248.54	1248.36	1247.84	1248.70	1242.02	1246.56	1248.15
347	2200	1248.53	1248.34	1247.82	1248.67	1242.03	1246.55	1248.12
347	2230	1248.51	1248.32	1247.78	1248.65	1242.02	1246.51	1248.09
347	2300	1248.49	1248.30	1247.75	1248.61	1242.03	1246.47	1248.04
347	2330	1248.58	1248.28	1247.73	1248.58	1242.02	1246.44	1248.00
348	0000	1248.46	1248.27	1247.71	1248.57	1242.02	1246.42	1247.97
348	0030	1248.34	1248.21	1247.69	1248.56	1242.02	1246.41	1247.94
348	0100	1248.21	1248.12	1247.67	1248.53	1242.02	1246.39	1247.91
348	0130	1248.32	1248.18	1247.65	1248.51	1242.02	1246.36	1247.87
348	0200	1248.22	1248.11	1247.62	1248.48	1241.99	1246.33	1247.84
348	0230	1248.19	1248.08	1247.60	1248.46	1242.02	1246.31	1247.81

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
348	0300	1247.97	1247.94	1247.59	1248.45	1242.03	1246.30	1247.78
348	0330	1248.02	1247.97	1247.57	1248.43	1242.01	1246.28	1247.76
348	0400	1248.04	1247.97	1247.55	1248.42	1242.02	1246.26	1247.73
348	0430	1247.86	1247.82	1247.53	1248.39	1242.02	1246.24	1247.70
348	0500	1247.83	1247.83	1247.51	1248.38	1242.02	1246.22	1247.68
348	0530	1247.78	1247.78	1247.49	1248.37	1242.03	1246.21	1247.66
348	0600	1247.84	1247.82	1247.48	1248.35	1242.02	1246.19	1247.63
348	0630	1247.76	1247.75	1247.45	1248.32	1242.00	1246.17	1247.60
348	0700	1247.65	1247.67	1247.41	1248.30	1242.00	1246.15	1247.56
348	0730	1247.69	1247.69	1247.39	1248.28	1241.99	1246.13	1247.54
348	0800	1247.59	1247.62	1247.38	1248.26	1241.99	1246.11	1247.52
348	0830	1247.59	1247.61	1247.41	1248.27	1242.28	1246.13	1247.55
348	0900	1247.56	1247.56	1247.38	1248.25	1242.05	1246.13	1247.51
348	0930	1247.45	1247.52	1247.35	1248.23	1242.04	1246.10	1247.48
348	1000	1247.77	1247.71	1247.41	1248.27	1241.97	1246.15	1247.44
348	1030	1247.91	1247.78	1247.46	1248.31	1241.95	1246.21	1247.42
348	1100	1247.96	1247.81	1247.49	1248.33	1241.91	1246.24	1247.40
348	1130	1248.00	1247.84	1247.52	1248.36	1241.88	1246.27	1247.38
348	1200	1248.07	1247.86	1247.55	1248.39	1241.86	1246.29	1247.38
348	1230	1248.06	1247.88	1247.58	1248.42	1241.91	1246.33	1247.38
348	1300	1248.07	1247.89	1247.60	1248.43	1241.87	1246.35	1247.37
348	1330	1248.07	1247.91	1247.62	1248.46	1241.86	1246.36	1247.37
348	1400	1248.16	1247.92	1247.63	1248.47	1241.85	1246.37	1247.37
348	1430	1248.08	1247.92	1247.64	1248.47	1241.86	1246.38	1247.36
348	1500	1248.13	1247.92	1247.65	1248.48	1241.86	1246.38	1247.35
348	1530	1248.24	1247.92	1247.65	1248.48	1241.85	1246.38	1247.35
348	1600	1248.06	1247.90	1247.63	1248.47	1241.81	1246.37	1247.33
348	1630	1248.04	1247.89	1247.63	1248.47	1241.83	1246.36	1247.32
348	1700	1248.04	1247.88	1247.63	1248.46	1241.84	1246.35	1247.31
348	1730	1248.05	1247.88	1247.62	1248.46	1241.82	1246.35	1247.30
348	1800	1248.74	1247.88	1247.63	1248.47	1241.81	1246.35	1247.29
348	1830	1248.06	1247.87	1247.62	1248.46	1241.81	1246.35	1247.27
348	1900	1248.10	1247.86	1247.61	1248.46	1241.81	1246.35	1247.26
348	1930	1248.00	1247.85	1247.61	1248.45	1241.79	1246.34	1247.25
348	2000	1247.98	1247.84	1247.61	1248.44	1241.81	1246.33	1247.24
348	2030	1247.96	1247.83	1247.59	1248.44	1241.81	1246.33	1247.23
348	2100	1247.96	1247.83	1247.59	1248.44	1241.79	1246.30	1247.22
348	2130	1247.96	1247.83	1247.59	1248.44	1241.81	1246.33	1247.21
348	2200	1247.94	1247.82	1247.59	1248.44	1241.81	1246.32	1247.21
348	2230	1247.93	1247.81	1247.58	1248.43	1241.80	1246.32	1247.20
348	2300	1247.93	1247.81	1247.58	1248.43	1241.81	1246.31	1247.19
348	2330	1247.93	1247.80	1247.57	1248.43	1241.81	1246.31	1247.19
349	0000	1247.92	1247.80	1247.57	1248.43	1241.81	1246.31	1247.18
349	0030	1247.92	1247.80	1247.58	1248.44	1241.82	1246.31	1247.18
349	0100	1247.91	1247.79	1247.56	1248.43	1241.82	1246.30	1247.17
349	0130	1247.91	1247.79	1247.56	1248.43	1241.82	1246.30	1247.16
349	0200	1247.90	1247.78	1247.56	1248.43	1241.82	1246.30	1247.15
349	0230	1247.89	1247.77	1247.55	1248.42	1241.81	1246.29	1247.14
349	0300	1247.88	1247.77	1247.54	1248.42	1241.82	1246.29	1247.15
349	0330	1247.88	1247.76	1247.54	1248.42	1241.83	1246.29	1247.13
349	0400	1247.86	1247.75	1247.52	1248.41	1241.82	1246.27	1247.12

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
349	0430	1247.86	1247.74	1247.52	1248.40	1241.82	1246.27	1247.12
349	0500	1247.85	1247.73	1247.51	1248.40	1241.82	1246.26	1247.10
349	0530	1247.84	1247.72	1247.51	1248.39	1241.82	1246.26	1247.09
349	0600	1247.82	1247.71	1247.49	1248.39	1241.81	1246.25	1247.08
349	0630	1247.82	1247.70	1247.48	1248.38	1241.81	1246.23	1247.08
349	0700	1247.80	1247.69	1247.47	1248.36	1241.80	1246.22	1247.06
349	0730	1247.79	1247.68	1247.47	1248.36	1241.80	1246.22	1247.05
349	0800	1247.78	1247.67	1247.45	1248.35	1241.78	1246.21	1247.04
349	0830	1247.76	1247.64	1247.43	1248.33	1241.78	1246.19	1247.02
349	0900	1247.46	1247.39	1247.41	1248.31	1241.81	1246.15	1247.01
349	0930	1246.20	1246.82	1247.40	1248.33	1241.85	1246.18	1247.18
349	1000	1245.46	1246.51	1247.52	1248.40	1241.78	1246.35	1247.42
349	1030	1246.18	1246.89	1247.58	1248.47	1241.77	1246.51	1247.64
349	1100	1246.74	1247.09	1247.52	1248.49	1241.94	1246.64	1247.82
349	1130	1246.95	1247.13	1247.39	1248.56	1241.99	1246.58	1247.97
349	1200	1247.10	1247.16	1247.30	1248.57	1242.34	1246.44	1248.07
349	1230	1247.21	1247.20	1247.27	1248.62	1241.15	1246.38	1248.18
349	1300	1247.24	1247.18	1247.22	1248.61	1240.91	1246.30	1248.26
349	1330	1247.26	1247.19	1247.20	1248.65	1240.84	1246.26	1248.34
349	1400	1247.28	1247.19	1247.18	1248.67	1240.79	1246.24	1248.41
349	1430	1247.28	1247.18	1247.16	1248.67	1240.83	1246.22	1248.46
349	1500	1247.29	1247.18	1247.15	1248.69	1240.82	1246.21	1248.52
349	1530	1247.30	1247.17	1247.14	1248.70	1240.81	1246.20	1248.56
349	1600	1247.31	1247.17	1247.13	1248.72	1240.82	1246.20	1248.60
349	1630	1247.29	1247.16	1247.12	1248.72	1240.85	1246.19	1248.63
349	1700	1247.26	1247.14	1247.10	1248.72	1240.84	1246.17	1248.64
349	1730	1247.26	1247.13	1247.09	1248.73	1240.81	1246.17	1248.67
349	1800	1247.26	1247.12	1247.08	1248.73	1240.80	1246.16	1248.69
349	1830	1247.24	1247.10	1247.06	1248.72	1240.80	1246.15	1248.70
349	1900	1247.22	1247.09	1247.05	1248.73	1240.81	1246.14	1248.72
349	1930	1247.21	1247.07	1247.03	1248.72	1240.81	1246.13	1248.72
349	2000	1247.19	1247.05	1247.02	1248.71	1240.83	1246.12	1248.72
349	2030	1247.18	1247.04	1247.01	1248.71	1240.82	1246.11	1248.73
349	2100	1247.17	1247.03	1247.00	1248.72	1240.82	1246.11	1248.74
349	2130	1247.16	1247.03	1246.99	1248.72	1240.80	1246.11	1248.75
349	2200	1247.15	1247.01	1246.98	1248.72	1240.81	1246.10	1248.76
349	2230	1247.14	1247.00	1246.98	1248.72	1240.81	1246.10	1248.77
349	2300	1247.14	1247.00	1246.97	1248.72	1240.81	1246.09	1248.78
349	2330	1247.13	1246.99	1246.97	1248.72	1240.81	1246.09	1248.78
350	0000	1247.13	1246.99	1246.97	1248.73	1240.81	1246.09	1248.80
350	0030	1247.13	1246.99	1246.97	1248.74	1240.81	1246.09	1248.80
350	0100	1247.12	1246.99	1246.97	1248.74	1240.81	1246.10	1248.81
350	0130	1247.12	1246.99	1246.97	1248.75	1240.81	1246.10	1248.82
350	0200	1247.11	1246.98	1246.97	1248.75	1240.81	1246.10	1248.82
350	0230	1247.11	1246.98	1246.97	1248.75	1240.81	1246.09	1248.83
350	0300	1247.11	1246.98	1246.97	1248.76	1240.81	1246.10	1248.84
350	0330	1247.11	1246.99	1246.97	1248.77	1240.81	1246.11	1248.85
350	0400	1247.12	1246.99	1246.98	1248.78	1240.81	1246.11	1248.86
350	0430	1247.12	1246.99	1246.98	1248.79	1240.81	1246.12	1248.87
350	0500	1247.12	1246.99	1246.98	1248.80	1240.80	1246.12	1248.88
350	0530	1247.12	1246.99	1246.98	1248.80	1240.80	1246.12	1248.89

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
350	0600	1247.12	1246.99	1246.99	1248.81	1240.80	1246.13	1248.89
350	0630	1247.11	1246.99	1246.98	1248.81	1240.80	1246.13	1248.90
350	0700	1247.11	1246.99	1246.98	1248.81	1240.80	1246.11	1248.90
350	0730	1247.11	1246.99	1246.98	1248.81	1240.80	1246.12	1248.90
350	0800	1247.11	1246.99	1246.98	1248.82	1240.79	1246.12	1248.91
350	0830	1247.11	1246.99	1246.99	1248.82	1240.79	1246.13	1248.92
350	0900	1247.09	1246.98	1246.98	1248.82	1240.79	1246.12	1248.91
350	0930	1247.09	1246.98	1246.97	1248.82	1240.78	1246.11	1248.91
350	1000	1247.10	1246.98	1246.98	1248.82	1240.78	1246.12	1248.92
350	1030	1247.10	1246.98	1246.99	1248.83	1240.78	1246.13	1248.92
350	1100	1247.11	1246.99	1246.99	1248.84	1240.79	1246.13	1248.93
350	1130	1247.11	1247.00	1247.00	1248.85	1240.79	1246.14	1248.94
350	1200	1247.14	1247.02	1247.03	1248.88	1240.77	1246.16	1248.97
350	1230	1247.16	1247.04	1247.05	1248.90	1240.78	1246.18	1248.99
350	1300	1247.17	1247.05	1247.06	1248.91	1240.79	1246.19	1249.01
350	1330	1247.19	1247.07	1247.08	1248.94	1240.78	1246.21	1249.02
350	1400	1247.20	1247.09	1247.10	1248.96	1240.78	1246.23	1249.05
350	1430	1247.20	1247.09	1247.10	1248.96	1240.78	1246.24	1249.06
350	1500	1247.21	1247.10	1247.11	1248.97	1240.78	1246.24	1249.06
350	1530	1247.20	1247.09	1247.10	1248.97	1240.80	1246.24	1249.06
350	1600	1247.19	1247.09	1247.10	1248.96	1240.79	1246.23	1249.06
350	1630	1247.19	1247.09	1247.10	1248.97	1240.80	1246.23	1249.06
350	1700	1247.19	1247.08	1247.10	1248.96	1240.80	1246.23	1249.06
350	1730	1247.19	1247.08	1247.10	1248.97	1240.80	1246.22	1249.06
350	1800	1247.19	1247.08	1247.10	1248.97	1240.80	1246.22	1249.07
350	1830	1247.18	1247.07	1247.09	1248.97	1240.79	1246.23	1249.06
350	1900	1247.18	1247.07	1247.10	1248.97	1240.79	1246.23	1249.07
350	1930	1247.17	1247.06	1247.09	1248.96	1240.80	1246.22	1249.06
350	2000	1247.26	1247.06	1247.08	1248.96	1240.79	1246.22	1249.06
350	2030	1247.16	1247.06	1247.08	1248.96	1240.79	1246.21	1249.06
350	2100	1247.85	1247.05	1247.07	1248.96	1240.79	1246.22	1249.06
350	2130	1247.16	1247.05	1247.08	1248.96	1240.80	1246.22	1249.06
350	2200	1247.15	1247.04	1247.07	1248.95	1240.79	1246.22	1249.06
350	2230	1247.14	1247.04	1247.06	1248.95	1240.79	1246.22	1249.06
350	2300	1247.16	1247.03	1247.06	1248.95	1240.80	1246.20	1249.05
350	2330	1247.14	1247.03	1247.06	1248.95	1240.79	1246.20	1249.06
351	0000	1247.25	1247.04	1247.07	1248.96	1240.79	1246.22	1249.06
351	0030	1247.43	1247.04	1247.07	1248.96	1240.79	1246.21	1249.06
351	0100	1247.45	1247.04	1247.08	1248.98	1240.79	1246.21	1249.07
351	0130	1247.31	1247.05	1247.09	1248.98	1240.79	1246.24	1249.08
351	0200	1247.71	1247.05	1247.09	1248.99	1240.80	1246.23	1249.08
351	0230	1247.43	1247.06	1247.09	1248.99	1240.79	1246.24	1249.08
351	0300	1247.15	1247.04	1247.08	1248.98	1240.80	1246.22	1249.08
351	0330	1247.20	1247.05	1247.09	1248.99	1240.79	1246.24	1249.08
351	0400	1247.15	1247.04	1247.07	1248.98	1240.81	1246.22	1249.08
351	0430	1247.09	1246.99	1247.02	1248.93	1240.82	1246.17	1249.04
351	0500	1247.11	1247.02	1247.05	1248.96	1240.78	1246.19	1249.06
351	0530	1247.12	1247.02	1247.05	1248.96	1240.77	1246.19	1249.06
351	0600	1247.11	1247.07	1247.11	1249.01	1240.78	1246.24	1249.11
351	0630	1247.17	1247.06	1247.10	1249.01	1240.79	1246.24	1249.11
351	0700	1247.13	1247.01	1247.05	1248.96	1240.81	1246.19	1249.08

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
351	0730	1247.40	1246.98	1247.02	1248.93	1240.80	1246.15	1249.05
351	0800	1247.06	1246.97	1247.01	1248.92	1240.80	1246.13	1249.04
351	0830	1247.04	1246.95	1246.98	1248.90	1240.79	1246.11	1249.01
351	0900	1247.02	1246.93	1246.97	1248.88	1240.78	1246.09	1249.00
351	0930	1247.02	1246.93	1246.97	1248.87	1240.77	1246.09	1248.99
351	1000	1246.88	1246.92	1246.97	1248.87	1240.80	1246.07	1248.98
351	1030	1247.00	1246.89	1246.94	1248.84	1240.79	1246.06	1248.97
351	1100	1247.02	1246.89	1246.93	1248.84	1240.79	1246.04	1248.96
351	1130	1247.45	1246.90	1246.95	1248.86	1240.78	1246.07	1248.97
351	1200	1247.00	1246.91	1246.96	1248.87	1240.79	1246.07	1248.98
351	1230	1247.01	1246.93	1246.97	1248.89	1240.79	1246.09	1248.99
351	1300	1247.03	1246.95	1246.99	1248.91	1240.78	1246.11	1249.01
351	1330	1247.05	1246.96	1247.01	1248.93	1240.79	1246.13	1249.02
351	1400	1247.05	1246.96	1247.01	1248.93	1240.80	1246.14	1249.03
351	1430	1247.04	1246.95	1247.01	1248.92	1240.78	1246.13	1249.03
351	1500	1247.01	1246.93	1246.97	1248.91	1240.81	1246.11	1249.01
351	1530	1247.01	1246.92	1246.97	1248.90	1240.81	1246.10	1249.00
351	1600	1247.02	1246.93	1246.99	1248.91	1240.78	1246.11	1249.02
351	1630	1247.02	1246.93	1246.99	1248.92	1240.80	1246.10	1249.01
351	1700	1247.05	1246.96	1247.01	1248.94	1240.77	1246.14	1249.03
351	1730	1247.04	1246.95	1247.01	1248.93	1240.80	1246.13	1249.03
351	1800	1247.02	1246.94	1246.99	1248.92	1240.79	1246.13	1249.02
351	1830	1247.03	1246.95	1247.01	1248.93	1240.79	1246.13	1249.03
351	1900	1247.01	1246.92	1246.98	1248.91	1240.79	1246.10	1249.01
351	1930	1247.01	1246.92	1246.98	1248.92	1240.79	1246.11	1249.01
351	2000	1246.98	1246.89	1246.95	1248.89	1240.80	1246.09	1248.98
351	2030	1246.98	1246.88	1246.94	1248.88	1240.81	1246.08	1248.97
351	2100	1246.95	1246.86	1246.92	1248.86	1240.81	1246.06	1248.96
351	2130	1246.96	1246.87	1246.93	1248.87	1240.80	1246.07	1248.96
351	2200	1246.94	1246.84	1246.91	1248.85	1240.80	1246.05	1248.94
351	2230	1246.92	1246.82	1246.89	1248.83	1240.78	1246.02	1248.93
351	2300	1246.92	1246.82	1246.89	1248.83	1240.81	1246.01	1248.92
351	2330	1246.90	1246.81	1246.88	1248.83	1240.79	1246.01	1248.91
352	0000	1246.90	1246.81	1246.88	1248.83	1240.79	1246.01	1248.92
352	0030	1246.94	1246.82	1246.89	1248.84	1240.78	1246.01	1248.93
352	0100	1246.90	1246.81	1246.88	1248.83	1240.78	1246.01	1248.92
352	0130	1246.90	1246.81	1246.88	1248.84	1240.80	1246.01	1248.93
352	0200	1246.91	1246.82	1246.89	1248.84	1240.78	1246.01	1248.93
352	0230	1246.90	1246.81	1246.88	1248.84	1240.80	1246.01	1248.93
352	0300	1246.87	1246.79	1246.85	1248.82	1240.78	1245.98	1248.91
352	0330	1246.87	1246.79	1246.86	1248.82	1240.78	1245.98	1248.91
352	0400	1246.85	1246.77	1246.84	1248.81	1240.80	1245.97	1248.90
352	0430	1246.85	1246.77	1246.84	1248.81	1240.80	1245.97	1248.89
352	0500	1246.85	1246.77	1246.84	1248.81	1240.80	1245.96	1248.89
352	0530	1246.85	1246.77	1246.84	1248.81	1240.79	1245.97	1248.90
352	0600	1246.86	1246.77	1246.84	1248.81	1240.79	1245.97	1248.90
352	0630	1246.86	1246.78	1246.85	1248.82	1240.78	1245.98	1248.90
352	0700	1246.86	1246.77	1246.85	1248.82	1240.78	1245.97	1248.90
352	0730	1246.85	1246.77	1246.84	1248.81	1240.79	1245.97	1248.90
352	0800	1246.81	1246.73	1246.80	1248.78	1240.81	1245.94	1248.86
352	0830	1246.80	1246.72	1246.80	1248.76	1240.80	1245.92	1248.85

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
352	0900	1246.81	1246.72	1246.80	1248.77	1240.79	1245.93	1248.85
352	0930	1246.83	1246.74	1246.82	1248.79	1240.77	1245.95	1248.86
352	1000	1246.83	1246.73	1246.81	1248.78	1240.79	1245.94	1248.86
352	1030	1246.81	1246.72	1246.80	1248.78	1240.78	1245.94	1248.85
352	1100	1246.81	1246.72	1246.80	1248.78	1240.77	1245.94	1248.85
352	1130	1246.83	1246.74	1246.82	1248.80	1240.77	1245.95	1248.87
352	1200	1246.84	1246.75	1246.84	1248.82	1240.77	1245.97	1248.89
352	1230	1246.84	1246.74	1246.83	1248.82	1240.79	1245.97	1248.89
352	1300	1246.86	1246.77	1246.85	1248.84	1240.78	1245.99	1248.91
352	1330	1246.87	1246.78	1246.86	1248.86	1240.77	1246.00	1248.93
352	1400	1246.86	1246.77	1246.85	1248.85	1240.79	1245.99	1248.92
352	1430	1246.86	1246.77	1246.84	1248.84	1240.79	1245.99	1248.93
352	1500	1246.85	1246.76	1246.84	1248.84	1240.81	1245.97	1248.92
352	1530	1246.84	1246.76	1246.84	1248.84	1240.81	1245.97	1248.92
352	1600	1246.84	1246.74	1246.83	1248.84	1240.82	1245.96	1248.91
352	1630	1246.82	1246.73	1246.81	1248.82	1240.80	1245.94	1248.90
352	1700	1246.81	1246.72	1246.80	1248.82	1240.79	1245.94	1248.90
352	1730	1246.79	1246.71	1246.79	1248.81	1240.79	1245.93	1248.89
352	1800	1246.78	1246.70	1246.78	1248.80	1240.78	1245.91	1248.88
352	1830	1246.76	1246.68	1246.77	1248.79	1240.78	1245.90	1248.87
352	1900	1246.76	1246.67	1246.75	1248.77	1240.78	1245.89	1248.86
352	1930	1246.74	1246.66	1246.75	1248.76	1240.78	1245.88	1248.85
352	2000	1246.73	1246.65	1246.74	1248.75	1240.78	1245.86	1248.84
352	2030	1246.73	1246.64	1246.72	1248.74	1240.78	1245.85	1248.83
352	2100	1246.72	1246.63	1246.71	1248.73	1240.78	1245.84	1248.82
352	2130	1246.72	1246.63	1246.71	1248.73	1240.78	1245.84	1248.82
352	2200	1246.70	1246.62	1246.69	1248.72	1240.79	1245.83	1248.81
352	2230	1246.69	1246.61	1246.69	1248.72	1240.78	1245.82	1248.80
352	2300	1246.69	1246.60	1246.68	1248.71	1240.78	1245.82	1248.80
352	2330	1246.69	1246.60	1246.68	1248.71	1240.78	1245.81	1248.79
353	0000	1246.68	1246.60	1246.67	1248.71	1240.78	1245.81	1248.78
353	0030	1246.68	1246.58	1246.67	1248.70	1240.78	1245.80	1248.77
353	0100	1246.67	1246.57	1246.65	1248.69	1240.78	1245.79	1248.76
353	0130	1246.66	1246.57	1246.64	1248.69	1240.78	1245.79	1248.76
353	0200	1246.66	1246.56	1246.64	1248.69	1240.78	1245.77	1248.75
353	0230	1246.64	1246.54	1246.63	1248.67	1240.78	1245.76	1248.74
353	0300	1246.64	1246.53	1246.62	1248.66	1240.78	1245.76	1248.73
353	0330	1246.62	1246.52	1246.61	1248.66	1240.78	1245.75	1248.72
353	0400	1246.61	1246.52	1246.60	1248.65	1240.78	1245.74	1248.71
353	0430	1246.60	1246.49	1246.58	1248.63	1240.79	1245.72	1248.70
353	0500	1246.59	1246.49	1246.58	1248.63	1240.78	1245.72	1248.69
353	0530	1246.57	1246.48	1246.56	1248.61	1240.78	1245.70	1248.67
353	0600	1246.56	1246.46	1246.54	1248.60	1240.79	1245.68	1248.66
353	0630	1246.54	1246.44	1246.53	1248.58	1240.79	1245.67	1248.64
353	0700	1246.53	1246.42	1246.51	1248.57	1240.79	1245.66	1248.63
353	0730	1246.51	1246.41	1246.50	1248.56	1240.78	1245.65	1248.61
353	0800	1246.49	1246.39	1246.47	1248.54	1240.79	1245.62	1248.59
353	0830	1246.48	1246.38	1246.47	1248.53	1240.78	1245.61	1248.58
353	0900	1246.47	1246.36	1246.44	1248.51	1240.79	1245.60	1248.56
353	0930	1246.45	1246.34	1246.43	1248.49	1240.78	1245.58	1248.55
353	1000	1246.43	1246.33	1246.41	1248.48	1240.79	1245.56	1248.53

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
353	1030	1246.42	1246.31	1246.39	1248.46	1240.78	1245.55	1248.52
353	1100	1246.41	1246.30	1246.38	1248.45	1240.78	1245.54	1248.50
353	1130	1246.39	1246.29	1246.37	1248.44	1240.78	1245.53	1248.49
353	1200	1246.39	1246.29	1246.37	1248.44	1240.78	1245.52	1248.48
353	1230	1246.39	1246.28	1246.37	1248.43	1240.78	1245.52	1248.47
353	1300	1246.39	1246.28	1246.37	1248.44	1240.77	1245.52	1248.48
353	1330	1246.39	1246.28	1246.37	1248.44	1240.77	1245.52	1248.48
353	1400	1246.39	1246.29	1246.37	1248.44	1240.76	1245.53	1248.48
353	1430	1246.40	1246.30	1246.37	1248.45	1240.76	1245.53	1248.48
353	1500	1246.39	1246.29	1246.37	1248.44	1240.78	1245.52	1248.48
353	1530	1246.39	1246.28	1246.36	1248.44	1240.79	1245.51	1248.47
353	1600	1246.43	1246.31	1246.42	1248.46	1240.78	1245.55	1248.47
353	1630	1246.43	1246.31	1246.44	1248.45	1240.79	1245.60	1248.46
353	1700	1246.44	1246.32	1246.45	1248.45	1240.78	1245.63	1248.46
353	1730	1246.46	1246.33	1246.47	1248.47	1240.78	1245.67	1248.46
353	1800	1246.46	1246.33	1246.47	1248.46	1240.79	1245.69	1248.45
353	1830	1246.48	1246.34	1246.48	1248.47	1240.78	1245.72	1248.45
353	1900	1246.50	1246.35	1246.50	1248.48	1240.77	1245.75	1248.45
353	1930	1246.51	1246.37	1246.51	1248.49	1240.77	1245.77	1248.46
353	2000	1246.53	1246.38	1246.53	1248.49	1240.77	1245.79	1248.46
353	2030	1246.55	1246.40	1246.54	1248.51	1240.77	1245.81	1248.47
353	2100	1246.56	1246.42	1246.56	1248.52	1240.77	1245.83	1248.47
353	2130	1246.58	1246.42	1246.56	1248.53	1240.78	1245.85	1248.48
353	2200	1246.58	1246.42	1246.56	1248.53	1240.78	1245.85	1248.47
353	2230	1246.57	1246.42	1246.56	1248.52	1240.78	1245.85	1248.47
353	2300	1246.59	1246.44	1246.58	1248.54	1240.77	1245.87	1248.47
353	2330	1246.60	1246.45	1246.59	1248.54	1240.77	1245.88	1248.48
354	0000	1246.60	1246.45	1246.60	1248.55	1240.77	1245.89	1248.48
354	0030	1246.63	1246.48	1246.61	1248.57	1240.76	1245.91	1248.50
354	0100	1246.64	1246.49	1246.62	1248.57	1240.76	1245.92	1248.51
354	0130	1246.65	1246.49	1246.63	1248.58	1240.77	1245.93	1248.52
354	0200	1246.65	1246.50	1246.63	1248.59	1240.77	1245.94	1248.52
354	0230	1246.66	1246.52	1246.64	1248.60	1240.77	1245.95	1248.52
354	0300	1246.68	1246.53	1246.65	1248.61	1240.76	1245.96	1248.54
354	0330	1246.68	1246.53	1246.66	1248.61	1240.77	1245.97	1248.53
354	0400	1246.68	1246.54	1246.66	1248.61	1240.77	1245.97	1248.54
354	0430	1246.69	1246.55	1246.67	1248.63	1240.77	1245.98	1248.55
354	0500	1246.70	1246.56	1246.68	1248.64	1240.77	1246.00	1248.55
354	0530	1246.71	1246.57	1246.68	1248.64	1240.77	1246.00	1248.56
354	0600	1246.71	1246.57	1246.69	1248.64	1240.78	1246.01	1248.56
354	0630	1246.71	1246.57	1246.68	1248.64	1240.78	1246.01	1248.56
354	0700	1246.70	1246.56	1246.67	1248.63	1240.78	1246.00	1248.55
354	0730	1246.70	1246.56	1246.68	1248.63	1240.77	1246.00	1248.55
354	0800	1246.71	1246.57	1246.68	1248.64	1240.77	1246.01	1248.55
354	0830	1246.71	1246.57	1246.69	1248.64	1240.76	1246.02	1248.55
354	0900	1246.87	1246.74	1246.82	1248.60	1240.83	1245.58	1248.54
354	0930	1247.03	1246.84	1246.72	1248.43	1241.06	1244.74	1248.49
354	1000	1247.13	1246.91	1246.62	1248.25	1242.28	1244.01	1248.40
354	1030	1247.21	1246.98	1246.54	1248.10	1243.19	1243.58	1248.32
354	1100	1247.31	1247.06	1246.51	1248.01	1243.75	1243.35	1248.25
354	1130	1247.41	1247.15	1246.61	1248.00	1244.09	1243.28	1248.20

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
354	1200	1247.51	1247.24	1246.71	1248.03	1244.34	1243.32	1248.17
354	1230	1247.60	1247.33	1246.82	1248.07	1244.52	1243.38	1248.15
354	1300	1247.68	1247.42	1246.90	1248.09	1244.68	1243.42	1248.13
354	1330	1247.77	1247.49	1246.96	1248.12	1244.79	1243.46	1248.13
354	1400	1247.83	1247.56	1247.01	1248.13	1244.91	1243.49	1248.12
354	1430	1247.89	1247.62	1247.05	1248.15	1245.00	1243.53	1248.12
354	1500	1247.95	1247.68	1247.11	1248.18	1245.08	1243.56	1248.12
354	1530	1247.99	1247.72	1247.13	1248.18	1245.15	1243.58	1248.11
354	1600	1248.03	1247.77	1247.16	1248.18	1245.20	1243.59	1248.09
354	1630	1248.06	1247.81	1247.18	1248.20	1245.25	1243.61	1248.09
354	1700	1248.10	1247.84	1247.21	1248.20	1245.30	1243.62	1248.08
354	1730	1248.13	1247.88	1247.24	1248.22	1245.32	1243.64	1248.08
354	1800	1248.16	1247.91	1247.25	1248.22	1245.35	1243.66	1248.07
354	1830	1248.19	1247.94	1247.27	1248.22	1245.38	1243.67	1248.07
354	1900	1248.21	1247.97	1247.29	1248.23	1245.40	1243.69	1248.07
354	1930	1248.23	1247.99	1247.30	1248.24	1245.42	1243.69	1248.07
354	2000	1248.25	1248.01	1247.32	1248.25	1245.44	1243.71	1248.06
354	2030	1248.27	1248.03	1247.33	1248.25	1245.45	1243.71	1248.06
354	2100	1248.28	1248.05	1247.33	1248.25	1245.47	1243.71	1248.05
354	2130	1248.30	1248.07	1247.35	1248.26	1245.47	1243.72	1248.05
354	2200	1248.31	1248.08	1247.35	1248.26	1245.48	1243.71	1248.05
354	2230	1248.32	1248.10	1247.36	1248.25	1245.48	1243.71	1248.04
354	2300	1248.34	1248.11	1247.37	1248.26	1245.49	1243.71	1248.04
354	2330	1248.35	1248.13	1247.39	1248.26	1245.51	1243.72	1248.04
355	0000	1248.36	1248.14	1247.39	1248.27	1245.51	1243.72	1248.04
355	0030	1248.38	1248.16	1247.41	1248.28	1245.52	1243.74	1248.05
355	0100	1248.40	1248.18	1247.42	1248.29	1245.53	1243.76	1248.05
355	0130	1248.42	1248.20	1247.44	1248.30	1245.54	1243.77	1248.05
355	0200	1248.43	1248.21	1247.44	1248.30	1245.55	1243.77	1248.06
355	0230	1248.44	1248.22	1247.45	1248.31	1245.55	1243.77	1248.06
355	0300	1248.45	1248.23	1247.45	1248.31	1245.55	1243.78	1248.05
355	0330	1248.46	1248.25	1247.46	1248.31	1245.55	1243.80	1248.06
355	0400	1248.47	1248.26	1247.47	1248.32	1245.56	1243.79	1248.06
355	0430	1248.48	1248.27	1247.48	1248.32	1245.57	1243.79	1248.06
355	0500	1248.51	1248.29	1247.50	1248.35	1245.58	1243.80	1248.07
355	0530	1248.52	1248.31	1247.51	1248.35	1245.59	1243.82	1248.08
355	0600	1248.54	1248.33	1247.53	1248.37	1245.60	1243.83	1248.09
355	0630	1248.54	1248.33	1247.52	1248.36	1245.60	1243.83	1248.09
355	0700	1248.54	1248.33	1247.53	1248.36	1245.60	1243.84	1248.09
355	0730	1248.54	1248.33	1247.52	1248.35	1245.59	1243.83	1248.08
355	0800	1248.54	1248.34	1247.52	1248.35	1245.58	1243.83	1248.08
355	0830	1248.54	1248.33	1247.48	1248.35	1245.58	1243.93	1248.05
355	0900	1248.52	1248.32	1247.51	1248.36	1245.50	1244.16	1248.04
355	0930	1248.51	1248.32	1247.53	1248.37	1245.36	1244.26	1248.04
355	1000	1248.49	1248.30	1247.54	1248.37	1245.28	1244.30	1248.04
355	1030	1248.47	1248.29	1247.54	1248.36	1245.23	1244.29	1248.04
355	1100	1248.46	1248.29	1247.55	1248.38	1245.20	1244.32	1248.05
355	1130	1248.46	1248.29	1247.56	1248.38	1245.21	1244.35	1248.06
355	1200	1248.47	1248.31	1247.58	1248.41	1245.16	1244.38	1248.09
355	1230	1248.47	1248.32	1247.60	1248.42	1245.23	1244.40	1248.10
355	1300	1248.47	1248.31	1247.60	1248.43	1245.18	1244.41	1248.12

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
355	1330	1248.48	1248.31	1247.61	1248.44	1245.16	1244.41	1248.13
355	1400	1248.47	1248.31	1247.61	1248.45	1245.15	1244.40	1248.14
355	1430	1248.46	1248.31	1247.61	1248.45	1245.07	1244.40	1248.15
355	1500	1248.48	1248.32	1247.66	1248.50	1245.41	1244.61	1248.15
355	1530	1248.53	1248.36	1247.80	1248.60	1245.78	1245.47	1248.20
355	1600	1248.58	1248.41	1247.92	1248.73	1246.20	1246.07	1248.26
355	1630	1248.65	1248.46	1248.05	1248.84	1246.58	1246.50	1248.33
355	1700	1248.73	1248.53	1248.17	1248.96	1246.94	1246.83	1248.40
355	1730	1248.81	1248.61	1248.29	1249.09	1247.24	1247.09	1248.48
355	1800	1248.89	1248.68	1248.40	1249.19	1247.47	1247.31	1248.56
355	1830	1248.97	1248.75	1248.51	1249.30	1247.68	1247.50	1248.64
355	1900	1249.04	1248.83	1248.61	1249.40	1247.86	1247.67	1248.71
355	1930	1249.11	1248.90	1248.69	1249.49	1248.02	1247.82	1248.78
355	2000	1249.18	1248.97	1248.78	1249.57	1248.16	1247.94	1248.85
355	2030	1249.24	1249.03	1248.86	1249.66	1248.29	1248.07	1248.91
355	2100	1249.30	1249.10	1248.94	1249.74	1248.40	1248.17	1248.97
355	2130	1249.36	1249.17	1249.02	1249.81	1248.50	1248.28	1249.03
355	2200	1249.43	1249.23	1249.08	1249.89	1248.61	1248.38	1249.09
355	2230	1249.48	1249.29	1249.15	1249.95	1248.69	1248.47	1249.15
355	2300	1249.53	1249.35	1249.21	1250.02	1248.77	1248.56	1249.20
355	2330	1249.58	1249.41	1249.28	1250.08	1248.85	1248.64	1249.26
356	0000	1249.62	1249.46	1249.34	1250.14	1248.93	1248.73	1249.31
356	0030	1249.68	1249.52	1249.40	1250.20	1249.00	1248.81	1249.37
356	0100	1249.72	1249.57	1249.45	1250.25	1249.05	1248.88	1249.41
356	0130	1249.77	1249.62	1249.51	1250.30	1249.12	1248.96	1249.46
356	0200	1249.80	1249.66	1249.56	1250.35	1249.17	1249.02	1249.51
356	0230	1249.83	1249.69	1249.59	1250.39	1249.22	1249.08	1249.55
356	0300	1249.86	1249.74	1249.63	1250.43	1249.27	1249.13	1249.58
356	0330	1249.89	1249.77	1249.67	1250.47	1249.32	1249.19	1249.62
356	0400	1249.93	1249.80	1249.71	1250.51	1249.37	1249.25	1249.66
356	0430	1249.95	1249.84	1249.75	1250.54	1249.41	1249.30	1249.70
356	0500	1249.98	1249.87	1249.79	1250.57	1249.46	1249.35	1249.73
356	0530	1250.00	1249.90	1249.82	1250.61	1249.49	1249.40	1249.76
356	0600	1250.03	1249.93	1249.86	1250.64	1249.54	1249.45	1249.80
356	0630	1250.06	1249.95	1249.88	1250.67	1249.58	1249.49	1249.83
356	0700	1250.07	1249.98	1249.90	1250.69	1249.61	1249.53	1249.85
356	0730	1250.10	1250.00	1249.93	1250.72	1249.66	1249.57	1249.88
356	0800	1250.11	1250.02	1249.95	1250.74	1249.68	1249.60	1249.90
356	0830	1250.13	1250.04	1249.98	1250.76	1249.71	1249.64	1249.93
356	0900	1250.14	1250.05	1249.99	1250.77	1249.73	1249.66	1249.94
356	0930	1250.15	1250.07	1250.00	1250.78	1249.75	1249.69	1249.96
356	1000	1250.17	1250.09	1250.03	1250.81	1249.78	1249.73	1249.98
356	1030	1250.19	1250.11	1250.05	1250.83	1249.84	1249.76	1250.01
356	1100	1250.21	1250.14	1250.08	1250.86	1249.83	1249.80	1250.04
356	1130	1250.24	1250.17	1250.11	1250.89	1249.91	1249.84	1250.07
356	1200	1250.27	1250.20	1250.14	1250.92	1249.89	1249.88	1250.10
356	1230	1250.30	1250.23	1250.17	1250.95	1250.06	1249.92	1250.13
356	1300	1250.33	1250.26	1250.20	1250.98	1250.02	1249.96	1250.16
356	1330	1250.35	1250.29	1250.23	1251.01	1250.11	1249.99	1250.18
356	1400	1250.37	1250.31	1250.26	1251.03	1250.14	1250.02	1250.21
356	1430	1250.39	1250.33	1250.27	1251.04	1250.16	1250.05	1250.24

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
356	1500	1250.42	1250.36	1250.30	1251.07	1250.18	1250.08	1250.26
356	1530	1250.43	1250.37	1250.32	1251.08	1250.21	1250.10	1250.28
356	1600	1250.44	1250.38	1250.33	1251.09	1250.22	1250.11	1250.28
356	1630	1250.44	1250.39	1250.33	1251.09	1250.23	1250.13	1250.30
356	1700	1250.46	1250.41	1250.36	1251.12	1250.25	1250.15	1250.32
356	1730	1250.48	1250.43	1250.38	1251.13	1250.27	1250.18	1250.34
356	1800	1250.50	1250.44	1250.39	1251.15	1250.29	1250.19	1250.36
356	1830	1250.50	1250.45	1250.40	1251.16	1250.30	1250.21	1250.37
356	1900	1250.51	1250.46	1250.41	1251.16	1250.32	1250.22	1250.37
356	1930	1250.51	1250.47	1250.41	1251.17	1250.33	1250.22	1250.38
356	2000	1250.52	1250.46	1250.41	1251.17	1250.34	1250.23	1250.38
356	2030	1250.53	1250.48	1250.43	1251.18	1250.35	1250.25	1250.40
356	2100	1250.54	1250.50	1250.44	1251.18	1250.37	1250.27	1250.41
356	2130	1250.55	1250.51	1250.46	1251.20	1250.39	1250.28	1250.42
356	2200	1250.56	1250.52	1250.47	1251.20	1250.40	1250.29	1250.44
356	2230	1250.58	1250.54	1250.49	1251.22	1250.42	1250.31	1250.45
356	2300	1250.59	1250.55	1250.49	1251.23	1250.43	1250.33	1250.46
356	2330	1250.61	1250.57	1250.52	1251.25	1250.45	1250.35	1250.47
357	0000	1250.62	1250.58	1250.53	1251.26	1250.47	1250.36	1250.48
357	0030	1250.64	1250.60	1250.55	1251.27	1250.49	1250.38	1250.50
357	0100	1250.66	1250.62	1250.57	1251.29	1250.56	1250.40	1250.52
357	0130	1250.67	1250.63	1250.58	1251.30	1250.56	1250.41	1250.53
357	0200	1250.67	1250.64	1250.58	1251.30	1250.56	1250.42	1250.54
357	0230	1250.67	1250.64	1250.58	1251.30	1250.56	1250.43	1250.54
357	0300	1250.69	1250.65	1250.60	1251.32	1250.56	1250.45	1250.56
357	0330	1250.71	1250.68	1250.62	1251.34	1250.59	1250.46	1250.57
357	0400	1250.73	1250.69	1250.64	1251.35	1250.61	1250.48	1250.59
357	0430	1250.74	1250.71	1250.66	1251.37	1250.62	1250.50	1250.61
357	0500	1250.76	1250.73	1250.67	1251.38	1250.64	1250.52	1250.62
357	0530	1250.78	1250.75	1250.69	1251.40	1250.66	1250.54	1250.64
357	0600	1250.78	1250.76	1250.70	1251.41	1250.66	1250.55	1250.65
357	0630	1250.79	1250.76	1250.70	1251.41	1250.68	1250.56	1250.66
357	0700	1250.80	1250.77	1250.71	1251.41	1250.67	1250.56	1250.66
357	0730	1250.80	1250.78	1250.72	1251.42	1250.70	1250.58	1250.67
357	0800	1250.81	1250.78	1250.73	1251.43	1250.69	1250.58	1250.68
357	0830	1250.82	1250.79	1250.74	1251.43	1250.64	1250.59	1250.69
357	0900	1250.82	1250.79	1250.74	1251.43	1250.63	1250.60	1250.69
357	0930	1250.82	1250.79	1250.74	1251.43	1250.60	1250.60	1250.69
357	1000	1250.82	1250.79	1250.73	1251.43	1250.64	1250.60	1250.69
357	1030	1250.82	1250.79	1250.73	1251.42	1250.65	1250.60	1250.69
357	1100	1250.82	1250.79	1250.74	1251.43	1250.63	1250.60	1250.70
357	1130	1250.83	1250.81	1250.75	1251.43	1250.65	1250.61	1250.70
357	1200	1250.85	1250.82	1250.77	1251.44	1250.63	1250.62	1250.71
357	1230	1250.87	1250.84	1250.79	1251.47	1250.67	1250.65	1250.73
357	1300	1250.89	1250.86	1250.80	1251.48	1250.73	1250.66	1250.75
357	1330	1250.90	1250.88	1250.82	1251.49	1250.71	1250.68	1250.77
357	1400	1250.91	1250.89	1250.83	1251.51	1250.80	1250.69	1250.78
357	1430	1250.94	1250.91	1250.85	1251.52	1250.96	1250.71	1250.80
357	1500	1250.94	1250.92	1250.86	1251.52	1250.84	1250.72	1250.81
357	1530	1250.95	1250.93	1250.87	1251.53	1250.71	1250.73	1250.81
357	1600	1250.96	1250.95	1250.89	1251.55	1250.87	1250.74	1250.83

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
357	1630	1250.98	1250.95	1250.90	1251.55	1250.90	1250.76	1250.84
357	1700	1250.98	1250.96	1250.90	1251.55	1250.93	1250.76	1250.84
357	1730	1250.99	1250.97	1250.91	1251.56	1250.93	1250.77	1250.86
357	1800	1251.00	1250.98	1250.92	1251.57	1250.91	1250.78	1250.87
357	1830	1251.00	1250.98	1250.92	1251.57	1250.89	1250.78	1250.87
357	1900	1251.01	1250.99	1250.93	1251.58	1250.86	1250.79	1250.87
357	1930	1251.02	1250.99	1250.94	1251.58	1250.91	1250.80	1250.88
357	2000	1251.02	1250.99	1250.94	1251.58	1250.87	1250.80	1250.89
357	2030	1251.02	1251.00	1250.94	1251.58	1250.90	1250.80	1250.89
357	2100	1251.02	1251.00	1250.95	1251.58	1250.91	1250.81	1250.89
357	2130	1251.02	1251.00	1250.95	1251.58	1250.91	1250.81	1250.89
357	2200	1251.03	1251.01	1250.94	1251.58	1250.92	1250.81	1250.89
357	2230	1251.03	1251.01	1250.95	1251.58	1250.92	1250.81	1250.89
357	2300	1251.03	1251.02	1250.96	1251.59	1250.94	1250.83	1250.90
357	2330	1251.04	1251.02	1250.96	1251.59	1250.92	1250.83	1250.91
358	0000	1251.04	1251.02	1250.97	1251.59	1250.94	1250.84	1250.91
358	0030	1251.05	1251.04	1250.98	1251.60	1250.94	1250.85	1250.92
358	0100	1251.06	1251.05	1250.99	1251.61	1250.96	1250.86	1250.93
358	0130	1251.07	1251.05	1251.00	1251.62	1250.97	1250.87	1250.94
358	0200	1251.08	1251.06	1251.00	1251.62	1250.98	1250.88	1250.95
358	0230	1251.10	1251.08	1251.02	1251.64	1250.99	1250.89	1250.96
358	0300	1251.10	1251.09	1251.03	1251.65	1250.99	1250.90	1250.97
358	0330	1251.11	1251.10	1251.04	1251.65	1251.04	1250.91	1250.98
358	0400	1251.12	1251.10	1251.05	1251.66	1251.01	1250.92	1250.99
358	0430	1251.13	1251.11	1251.06	1251.67	1251.06	1250.93	1251.00
358	0500	1251.15	1251.13	1251.07	1251.68	1251.05	1250.95	1251.01
358	0530	1251.15	1251.14	1251.08	1251.69	1251.06	1250.96	1251.02
358	0600	1251.15	1251.14	1251.08	1251.69	1251.06	1250.96	1251.03
358	0630	1251.16	1251.15	1251.09	1251.69	1251.07	1250.96	1251.03
358	0700	1251.16	1251.14	1251.09	1251.69	1251.06	1250.96	1251.04
358	0730	1251.16	1251.15	1251.09	1251.69	1251.05	1250.97	1251.04
358	0800	1251.16	1251.15	1251.09	1251.69	1251.05	1250.97	1251.04
358	0830	1251.16	1251.14	1251.09	1251.69	1251.01	1250.97	1251.04
358	0900	1251.17	1251.15	1251.10	1251.69	1250.99	1250.98	1251.05
358	0930	1251.18	1251.16	1251.11	1251.69	1251.01	1250.99	1251.05
358	1000	1251.18	1251.17	1251.11	1251.70	1251.05	1250.99	1251.06
358	1030	1251.18	1251.17	1251.12	1251.70	1251.07	1250.99	1251.06
358	1100	1251.19	1251.17	1251.12	1251.70	1251.06	1251.00	1251.06
358	1130	1251.20	1251.18	1251.13	1251.72	1251.06	1251.01	1251.07
358	1200	1251.22	1251.21	1251.15	1251.73	1251.07	1251.03	1251.09
358	1230	1251.25	1251.23	1251.17	1251.75	1251.10	1251.06	1251.11
358	1300	1251.26	1251.25	1251.20	1251.78	1251.15	1251.08	1251.13
358	1330	1251.30	1251.28	1251.22	1251.81	1251.18	1251.10	1251.16
358	1400	1251.31	1251.30	1251.24	1251.82	1251.20	1251.12	1251.18
358	1430	1251.32	1251.30	1251.25	1251.82	1251.21	1251.13	1251.19
358	1500	1251.32	1251.31	1251.25	1251.83	1251.23	1251.13	1251.20
358	1530	1251.32	1251.30	1251.25	1251.82	1251.23	1251.13	1251.20
358	1600	1251.32	1251.31	1251.25	1251.82	1251.22	1251.14	1251.20
358	1630	1251.32	1251.31	1251.25	1251.82	1251.25	1251.13	1251.20
358	1700	1251.32	1251.31	1251.26	1251.82	1251.29	1251.14	1251.21
358	1730	1251.32	1251.31	1251.25	1251.82	1251.27	1251.14	1251.21

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
358	1800	1251.32	1251.30	1251.25	1251.82	1251.24	1251.14	1251.21
358	1830	1251.31	1251.30	1251.25	1251.81	1251.23	1251.14	1251.20
358	1900	1251.31	1251.30	1251.25	1251.81	1251.24	1251.13	1251.20
358	1930	1251.30	1251.29	1251.24	1251.79	1251.22	1251.12	1251.19
358	2000	1251.30	1251.29	1251.24	1251.79	1251.22	1251.13	1251.19
358	2030	1251.29	1251.28	1251.24	1251.79	1251.21	1251.13	1251.18
358	2100	1251.29	1251.28	1251.23	1251.78	1251.23	1251.12	1251.19
358	2130	1251.28	1251.27	1251.23	1251.78	1251.21	1251.11	1251.18
358	2200	1251.28	1251.27	1251.22	1251.78	1251.20	1251.11	1251.18
358	2230	1251.28	1251.27	1251.22	1251.77	1251.20	1251.11	1251.17
358	2300	1251.28	1251.27	1251.22	1251.77	1251.21	1251.11	1251.17
358	2330	1251.28	1251.27	1251.23	1251.78	1251.21	1251.11	1251.18
359	0000	1251.29	1251.27	1251.23	1251.78	1251.22	1251.12	1251.18
359	0030	1251.27	1251.26	1251.22	1251.76	1251.21	1251.11	1251.17
359	0100	1251.27	1251.26	1251.21	1251.76	1251.20	1251.11	1251.17
359	0130	1251.28	1251.26	1251.22	1251.76	1251.21	1251.11	1251.17
359	0200	1251.26	1251.25	1251.20	1251.74	1251.19	1251.11	1251.16
359	0230	1251.26	1251.25	1251.21	1251.74	1251.20	1251.11	1251.16
359	0300	1251.26	1251.25	1251.21	1251.74	1251.20	1251.11	1251.16
359	0330	1251.26	1251.25	1251.20	1251.74	1251.20	1251.11	1251.16
359	0400	1251.27	1251.26	1251.22	1251.75	1251.22	1251.12	1251.17
359	0430	1251.27	1251.26	1251.22	1251.75	1251.23	1251.12	1251.17
359	0500	1251.27	1251.26	1251.22	1251.74	1251.23	1251.12	1251.17
359	0530	1251.27	1251.26	1251.22	1251.74	1251.22	1251.12	1251.17
359	0600	1251.27	1251.26	1251.21	1251.74	1251.22	1251.12	1251.17
359	0630	1251.27	1251.26	1251.22	1251.74	1251.23	1251.12	1251.17
359	0700	1251.27	1251.25	1251.21	1251.74	1251.23	1251.12	1251.17
359	0730	1251.26	1251.25	1251.21	1251.73	1251.22	1251.12	1251.16
359	0800	1251.26	1251.25	1251.21	1251.73	1251.22	1251.12	1251.16
359	0830	1251.26	1251.25	1251.21	1251.73	1251.21	1251.12	1251.16
359	0900	1251.25	1251.24	1251.18	1251.71	1251.21	1251.11	1251.15
359	0930	1251.23	1251.23	1251.18	1251.69	1251.19	1251.10	1251.14
359	1000	1251.23	1251.22	1251.18	1251.69	1251.19	1251.09	1251.14
359	1030	1251.23	1251.21	1251.16	1251.69	1251.18	1251.09	1251.13
359	1100	1251.23	1251.22	1251.17	1251.69	1251.18	1251.09	1251.13
359	1130	1251.24	1251.23	1251.18	1251.69	1251.19	1251.09	1251.14
359	1200	1251.26	1251.25	1251.20	1251.71	1251.20	1251.11	1251.14
359	1230	1251.29	1251.28	1251.23	1251.73	1251.23	1251.14	1251.17
359	1300	1251.31	1251.30	1251.25	1251.76	1251.31	1251.16	1251.19
359	1330	1251.33	1251.31	1251.27	1251.78	1251.27	1251.18	1251.21
359	1400	1251.34	1251.33	1251.29	1251.79	1251.28	1251.20	1251.23
359	1430	1251.35	1251.33	1251.28	1251.79	1251.31	1251.20	1251.23
359	1500	1251.35	1251.34	1251.29	1251.79	1251.31	1251.20	1251.24
359	1530	1251.34	1251.34	1251.29	1251.79	1251.32	1251.20	1251.24
359	1600	1251.35	1251.33	1251.28	1251.78	1251.33	1251.20	1251.24
359	1630	1251.35	1251.34	1251.29	1251.78	1251.33	1251.21	1251.24
359	1700	1251.34	1251.33	1251.28	1251.78	1251.33	1251.20	1251.23
359	1730	1251.34	1251.33	1251.28	1251.78	1251.32	1251.20	1251.23
359	1800	1251.34	1251.32	1251.28	1251.77	1251.31	1251.19	1251.23
359	1830	1251.34	1251.33	1251.29	1251.78	1251.31	1251.20	1251.24
359	1900	1251.36	1251.35	1251.31	1251.80	1251.33	1251.23	1251.26

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
359	1930	1251.37	1251.36	1251.32	1251.80	1251.34	1251.23	1251.26
359	2000	1251.38	1251.37	1251.32	1251.81	1251.34	1251.24	1251.27
359	2030	1251.38	1251.38	1251.33	1251.82	1251.35	1251.24	1251.28
359	2100	1251.40	1251.39	1251.35	1251.83	1251.35	1251.27	1251.29
359	2130	1251.41	1251.40	1251.35	1251.84	1251.36	1251.27	1251.30
359	2200	1251.40	1251.39	1251.34	1251.82	1251.36	1251.27	1251.30
359	2230	1251.40	1251.39	1251.34	1251.82	1251.35	1251.26	1251.30
359	2300	1251.40	1251.39	1251.35	1251.82	1251.36	1251.27	1251.30
359	2330	1251.39	1251.38	1251.34	1251.81	1251.35	1251.26	1251.29
360	0000	1251.38	1251.37	1251.33	1251.81	1251.35	1251.25	1251.29
360	0030	1251.38	1251.38	1251.33	1251.81	1251.35	1251.26	1251.29
360	0100	1251.41	1251.40	1251.36	1251.83	1251.37	1251.28	1251.31
360	0130	1251.42	1251.42	1251.37	1251.84	1251.39	1251.29	1251.32
360	0200	1251.42	1251.41	1251.37	1251.84	1251.39	1251.29	1251.32
360	0230	1251.44	1251.43	1251.38	1251.86	1251.39	1251.30	1251.34
360	0300	1251.44	1251.43	1251.39	1251.86	1251.40	1251.31	1251.34
360	0330	1251.45	1251.44	1251.40	1251.87	1251.41	1251.32	1251.35
360	0400	1251.45	1251.44	1251.40	1251.87	1251.42	1251.33	1251.35
360	0430	1251.46	1251.45	1251.41	1251.87	1251.42	1251.33	1251.36
360	0500	1251.48	1251.47	1251.43	1251.89	1251.43	1251.35	1251.38
360	0530	1251.48	1251.47	1251.43	1251.89	1251.43	1251.35	1251.38
360	0600	1251.48	1251.47	1251.43	1251.89	1251.43	1251.35	1251.39
360	0630	1251.49	1251.48	1251.44	1251.90	1251.44	1251.36	1251.40
360	0700	1251.50	1251.49	1251.45	1251.91	1251.46	1251.37	1251.41
360	0730	1251.50	1251.49	1251.45	1251.91	1251.46	1251.37	1251.41
360	0800	1251.50	1251.49	1251.45	1251.90	1251.45	1251.38	1251.41
360	0830	1251.50	1251.49	1251.44	1251.90	1251.44	1251.37	1251.41
360	0900	1251.50	1251.49	1251.45	1251.91	1251.44	1251.38	1251.42
360	0930	1251.49	1251.50	1251.46	1251.91	1251.42	1251.38	1251.42
360	1000	1251.49	1251.49	1251.45	1251.90	1251.46	1251.37	1251.41
360	1030	1251.49	1251.48	1251.44	1251.89	1251.42	1251.36	1251.40
360	1100	1251.50	1251.49	1251.45	1251.89	1251.42	1251.37	1251.41
360	1130	1251.50	1251.50	1251.46	1251.91	1251.44	1251.39	1251.42
360	1200	1251.56	1251.52	1251.48	1251.93	1251.47	1251.40	1251.43
360	1230	1251.55	1251.54	1251.50	1251.94	1251.48	1251.42	1251.45
360	1300	1251.56	1251.55	1251.51	1251.96	1251.48	1251.44	1251.47
360	1330	1251.62	1251.57	1251.54	1251.98	1251.54	1251.46	1251.49
360	1400	1251.58	1251.58	1251.54	1251.98	1251.53	1251.46	1251.50
360	1430	1251.59	1251.58	1251.55	1251.99	1251.54	1251.47	1251.50
360	1500	1251.59	1251.58	1251.55	1251.99	1251.56	1251.47	1251.51
360	1530	1251.59	1251.59	1251.55	1251.99	1251.54	1251.48	1251.51
360	1600	1251.59	1251.60	1251.56	1251.99	1251.54	1251.48	1251.52
360	1630	1251.60	1251.60	1251.56	1251.99	1251.57	1251.49	1251.52
360	1700	1251.60	1251.59	1251.56	1251.99	1251.59	1251.48	1251.53
360	1730	1251.60	1251.59	1251.55	1251.98	1251.57	1251.48	1251.52
360	1800	1251.58	1251.58	1251.54	1251.96	1251.52	1251.47	1251.51
360	1830	1251.57	1251.56	1251.53	1251.95	1251.53	1251.46	1251.50
360	1900	1251.56	1251.55	1251.52	1251.94	1251.52	1251.45	1251.49
360	1930	1251.54	1251.54	1251.51	1251.94	1251.51	1251.44	1251.48
360	2000	1251.54	1251.54	1251.51	1251.94	1251.50	1251.44	1251.48
360	2030	1251.54	1251.54	1251.51	1251.93	1251.51	1251.44	1251.48

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
360	2100	1251.54	1251.54	1251.51	1251.93	1251.52	1251.44	1251.48
360	2130	1251.53	1251.53	1251.50	1251.92	1251.50	1251.43	1251.47
360	2200	1251.53	1251.53	1251.50	1251.91	1251.51	1251.43	1251.47
360	2230	1251.53	1251.52	1251.49	1251.91	1251.50	1251.43	1251.47
360	2300	1251.52	1251.51	1251.48	1251.90	1251.48	1251.42	1251.46
360	2330	1251.51	1251.50	1251.47	1251.89	1251.49	1251.41	1251.45
361	0000	1251.50	1251.49	1251.46	1251.87	1251.49	1251.40	1251.44
361	0030	1251.50	1251.49	1251.46	1251.87	1251.48	1251.40	1251.44
361	0100	1251.51	1251.50	1251.47	1251.89	1251.48	1251.41	1251.44
361	0130	1251.52	1251.51	1251.48	1251.90	1251.50	1251.42	1251.45
361	0200	1251.52	1251.52	1251.49	1251.90	1251.51	1251.43	1251.46
361	0230	1251.54	1251.53	1251.50	1251.91	1251.52	1251.44	1251.47
361	0300	1251.53	1251.52	1251.49	1251.90	1251.51	1251.44	1251.47
361	0330	1251.53	1251.52	1251.49	1251.90	1251.51	1251.43	1251.46
361	0400	1251.53	1251.52	1251.49	1251.90	1251.51	1251.43	1251.47
361	0430	1251.52	1251.51	1251.49	1251.90	1251.51	1251.43	1251.46
361	0500	1251.51	1251.51	1251.47	1251.88	1251.50	1251.42	1251.46
361	0530	1251.50	1251.50	1251.46	1251.87	1251.50	1251.41	1251.45
361	0600	1251.49	1251.48	1251.45	1251.86	1251.48	1251.40	1251.44
361	0630	1251.48	1251.47	1251.44	1251.85	1251.47	1251.39	1251.42
361	0700	1251.46	1251.46	1251.43	1251.84	1251.46	1251.38	1251.41
361	0730	1251.46	1251.45	1251.42	1251.82	1251.46	1251.37	1251.40
361	0800	1251.45	1251.44	1251.42	1251.82	1251.45	1251.36	1251.40
361	0830	1251.45	1251.43	1251.41	1251.81	1251.44	1251.36	1251.39
361	0900	1251.43	1251.42	1251.39	1251.79	1251.42	1251.35	1251.38
361	0930	1251.42	1251.41	1251.38	1251.79	1251.40	1251.34	1251.37
361	1000	1251.42	1251.41	1251.38	1251.78	1251.41	1251.33	1251.36
361	1030	1251.42	1251.41	1251.38	1251.78	1251.41	1251.34	1251.36
361	1100	1251.42	1251.42	1251.39	1251.78	1251.41	1251.34	1251.36
361	1130	1251.45	1251.43	1251.40	1251.79	1251.44	1251.35	1251.37
361	1200	1251.45	1251.44	1251.41	1251.81	1251.47	1251.36	1251.38
361	1230	1251.46	1251.45	1251.41	1251.81	1251.47	1251.37	1251.39
361	1300	1251.48	1251.47	1251.43	1251.82	1251.48	1251.39	1251.40
361	1330	1251.50	1251.48	1251.45	1251.84	1251.50	1251.41	1251.42
361	1400	1251.50	1251.49	1251.46	1251.85	1251.53	1251.42	1251.43
361	1430	1251.51	1251.50	1251.47	1251.86	1251.52	1251.43	1251.44
361	1500	1251.52	1251.51	1251.48	1251.87	1251.54	1251.44	1251.45
361	1530	1251.51	1251.50	1251.47	1251.86	1251.52	1251.43	1251.45
361	1600	1251.51	1251.50	1251.47	1251.85	1251.56	1251.43	1251.45
361	1630	1251.50	1251.50	1251.46	1251.85	1251.51	1251.42	1251.44
361	1700	1251.50	1251.50	1251.46	1251.85	1251.55	1251.43	1251.44
361	1730	1251.50	1251.50	1251.46	1251.85	1251.53	1251.43	1251.44
361	1800	1251.49	1251.48	1251.45	1251.84	1251.52	1251.41	1251.43
361	1830	1251.49	1251.48	1251.45	1251.83	1251.51	1251.41	1251.43
361	1900	1251.48	1251.48	1251.45	1251.83	1251.51	1251.41	1251.43
361	1930	1251.48	1251.47	1251.44	1251.82	1251.51	1251.40	1251.42
361	2000	1251.47	1251.47	1251.44	1251.81	1251.50	1251.40	1251.41
361	2030	1251.47	1251.47	1251.43	1251.81	1251.50	1251.39	1251.41
361	2100	1251.47	1251.47	1251.43	1251.81	1251.50	1251.40	1251.41
361	2130	1251.47	1251.46	1251.43	1251.81	1251.50	1251.40	1251.41
361	2200	1251.47	1251.46	1251.43	1251.81	1251.50	1251.40	1251.41

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
361	2230	1251.47	1251.47	1251.43	1251.81	1251.50	1251.40	1251.41
361	2300	1251.46	1251.46	1251.43	1251.80	1251.50	1251.40	1251.40
361	2330	1251.47	1251.46	1251.43	1251.80	1251.49	1251.40	1251.41
362	0000	1251.46	1251.46	1251.43	1251.79	1251.50	1251.40	1251.40
362	0030	1251.46	1251.46	1251.43	1251.79	1251.50	1251.40	1251.40
362	0100	1251.47	1251.46	1251.43	1251.80	1251.50	1251.40	1251.41
362	0130	1251.48	1251.47	1251.44	1251.81	1251.51	1251.41	1251.41
362	0200	1251.48	1251.47	1251.44	1251.81	1251.52	1251.41	1251.42
362	0230	1251.48	1251.47	1251.44	1251.80	1251.52	1251.41	1251.42
362	0300	1251.48	1251.48	1251.45	1251.81	1251.53	1251.41	1251.42
362	0330	1251.49	1251.48	1251.45	1251.81	1251.53	1251.42	1251.42
362	0400	1251.49	1251.49	1251.45	1251.82	1251.54	1251.43	1251.43
362	0430	1251.50	1251.49	1251.46	1251.82	1251.55	1251.43	1251.43
362	0500	1251.49	1251.48	1251.45	1251.82	1251.54	1251.43	1251.43
362	0530	1251.49	1251.49	1251.46	1251.82	1251.54	1251.43	1251.43
362	0600	1251.49	1251.49	1251.46	1251.81	1251.54	1251.43	1251.43
362	0630	1251.49	1251.49	1251.46	1251.81	1251.54	1251.43	1251.43
362	0700	1251.49	1251.49	1251.45	1251.81	1251.54	1251.43	1251.43
362	0730	1251.49	1251.49	1251.46	1251.81	1251.54	1251.43	1251.44
362	0800	1251.49	1251.49	1251.46	1251.81	1251.54	1251.43	1251.43
362	0830	1251.49	1251.48	1251.45	1251.81	1251.52	1251.43	1251.43
362	0900	1251.49	1251.49	1251.46	1251.81	1251.52	1251.43	1251.44
362	0930	1251.49	1251.49	1251.46	1251.81	1251.52	1251.43	1251.43
362	1000	1251.48	1251.48	1251.45	1251.80	1251.51	1251.42	1251.43
362	1030	1251.49	1251.49	1251.45	1251.80	1251.52	1251.43	1251.43
362	1100	1251.50	1251.49	1251.46	1251.81	1251.51	1251.43	1251.43
362	1130	1251.51	1251.51	1251.47	1251.82	1251.53	1251.45	1251.45
362	1200	1251.53	1251.53	1251.49	1251.84	1251.50	1251.46	1251.46
362	1230	1251.54	1251.55	1251.50	1251.85	1251.55	1251.47	1251.48
362	1300	1251.56	1251.56	1251.52	1251.86	1251.59	1251.49	1251.49
362	1330	1251.57	1251.57	1251.53	1251.87	1251.61	1251.50	1251.50
362	1400	1251.59	1251.59	1251.56	1251.90	1251.63	1251.53	1251.52
362	1430	1251.61	1251.61	1251.57	1251.91	1251.63	1251.54	1251.54
362	1500	1251.62	1251.62	1251.59	1251.93	1251.63	1251.56	1251.56
362	1530	1251.62	1251.62	1251.59	1251.93	1251.66	1251.56	1251.56
362	1600	1251.62	1251.63	1251.59	1251.93	1251.66	1251.56	1251.57
362	1630	1251.62	1251.62	1251.59	1251.92	1251.67	1251.56	1251.56
362	1700	1251.62	1251.62	1251.59	1251.92	1251.67	1251.56	1251.57
362	1730	1251.63	1251.62	1251.59	1251.93	1251.67	1251.56	1251.57
362	1800	1251.62	1251.63	1251.59	1251.92	1251.65	1251.56	1251.57
362	1830	1251.62	1251.63	1251.59	1251.92	1251.65	1251.56	1251.57
362	1900	1251.61	1251.62	1251.59	1251.91	1251.66	1251.56	1251.57
362	1930	1251.61	1251.62	1251.59	1251.91	1251.64	1251.56	1251.57
362	2000	1251.62	1251.62	1251.59	1251.91	1251.64	1251.56	1251.56
362	2030	1251.62	1251.63	1251.59	1251.91	1251.64	1251.56	1251.57
362	2100	1251.62	1251.62	1251.59	1251.91	1251.64	1251.56	1251.57
362	2130	1251.62	1251.62	1251.59	1251.91	1251.64	1251.56	1251.57
362	2200	1251.62	1251.62	1251.59	1251.91	1251.64	1251.56	1251.57
362	2230	1251.63	1251.63	1251.60	1251.92	1251.66	1251.57	1251.57
362	2300	1251.63	1251.63	1251.60	1251.92	1251.66	1251.58	1251.58
362	2330	1251.63	1251.64	1251.61	1251.93	1251.66	1251.58	1251.59

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
363	0000	1251.63	1251.64	1251.61	1251.94	1251.67	1251.58	1251.59
363	0030	1251.65	1251.65	1251.62	1251.94	1251.67	1251.59	1251.60
363	0100	1251.65	1251.66	1251.63	1251.95	1251.68	1251.60	1251.61
363	0130	1251.66	1251.66	1251.64	1251.95	1251.68	1251.60	1251.61
363	0200	1251.66	1251.67	1251.64	1251.95	1251.69	1251.61	1251.62
363	0230	1251.66	1251.67	1251.64	1251.96	1251.69	1251.61	1251.62
363	0300	1251.67	1251.67	1251.65	1251.96	1251.69	1251.61	1251.63
363	0330	1251.67	1251.68	1251.65	1251.96	1251.70	1251.62	1251.63
363	0400	1251.68	1251.69	1251.66	1251.97	1251.71	1251.63	1251.64
363	0430	1251.69	1251.69	1251.67	1251.98	1251.71	1251.63	1251.65
363	0500	1251.68	1251.69	1251.66	1251.97	1251.71	1251.63	1251.65
363	0530	1251.68	1251.69	1251.66	1251.97	1251.71	1251.63	1251.65
363	0600	1251.69	1251.69	1251.66	1251.97	1251.71	1251.64	1251.65
363	0630	1251.69	1251.69	1251.67	1251.98	1251.71	1251.64	1251.65
363	0700	1251.69	1251.69	1251.67	1251.98	1251.71	1251.64	1251.65
363	0730	1251.68	1251.69	1251.67	1251.96	1251.70	1251.64	1251.65
363	0800	1251.68	1251.68	1251.66	1251.96	1251.69	1251.63	1251.65
363	0830	1251.67	1251.67	1251.65	1251.95	1251.67	1251.62	1251.64
363	0900	1251.67	1251.67	1251.65	1251.95	1251.67	1251.62	1251.64
363	0930	1251.67	1251.67	1251.65	1251.95	1251.67	1251.62	1251.64
363	1000	1251.66	1251.67	1251.64	1251.94	1251.67	1251.61	1251.63
363	1030	1251.66	1251.66	1251.64	1251.94	1251.73	1251.61	1251.63
363	1100	1251.66	1251.67	1251.64	1251.94	1251.60	1251.61	1251.63
363	1130	1251.67	1251.68	1251.65	1251.95	1251.66	1251.63	1251.64
363	1200	1251.69	1251.70	1251.67	1251.97	1251.74	1251.64	1251.65
363	1230	1251.70	1251.71	1251.68	1251.98	1251.67	1251.65	1251.66
363	1300	1251.72	1251.72	1251.70	1251.99	1251.75	1251.67	1251.68
363	1330	1251.75	1251.75	1251.73	1252.03	1251.79	1251.70	1251.71
363	1400	1251.77	1251.78	1251.76	1252.05	1251.77	1251.72	1251.73
363	1430	1251.79	1251.79	1251.77	1252.07	1251.81	1251.74	1251.74
363	1500	1251.81	1251.81	1251.79	1252.08	1251.84	1251.76	1251.77
363	1530	1251.80	1251.81	1251.78	1252.07	1251.81	1251.75	1251.77
363	1600	1251.80	1251.80	1251.78	1252.07	1251.80	1251.75	1251.77
363	1630	1251.82	1251.82	1251.79	1252.08	1251.81	1251.77	1251.78
363	1700	1251.82	1251.83	1251.80	1252.09	1251.83	1251.77	1251.78
363	1730	1251.83	1251.83	1251.81	1252.10	1251.83	1251.78	1251.79
363	1800	1251.84	1251.84	1251.82	1252.10	1251.84	1251.78	1251.80
363	1830	1251.84	1251.84	1251.82	1252.10	1251.83	1251.78	1251.81
363	1900	1251.84	1251.83	1251.81	1252.10	1251.83	1251.78	1251.80
363	1930	1251.82	1251.82	1251.80	1252.08	1251.81	1251.77	1251.79
363	2000	1251.82	1251.82	1251.80	1252.08	1251.83	1251.77	1251.79
363	2030	1251.80	1251.80	1251.78	1252.06	1251.79	1251.74	1251.77
363	2100	1251.81	1251.81	1251.80	1252.07	1251.80	1251.75	1251.78
363	2130	1251.82	1251.82	1251.80	1252.07	1251.81	1251.76	1251.78
363	2200	1251.82	1251.82	1251.80	1252.07	1251.81	1251.76	1251.79
363	2230	1251.83	1251.83	1251.81	1252.08	1251.82	1251.77	1251.79
363	2300	1251.83	1251.83	1251.81	1252.08	1251.81	1251.77	1251.79
363	2330	1251.84	1251.84	1251.82	1252.08	1251.82	1251.77	1251.80
364	0000	1251.85	1251.85	1251.83	1252.10	1251.84	1251.79	1251.81
364	0030	1251.86	1251.86	1251.85	1252.12	1251.85	1251.81	1251.83
364	0100	1251.88	1251.88	1251.87	1252.14	1251.87	1251.82	1251.85

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
364	0130	1251.89	1251.89	1251.88	1252.15	1251.88	1251.84	1251.85
364	0200	1251.89	1251.89	1251.88	1252.14	1251.87	1251.84	1251.86
364	0230	1251.90	1251.90	1251.89	1252.15	1251.88	1251.84	1251.87
364	0300	1251.91	1251.91	1251.89	1252.16	1251.89	1251.85	1251.87
364	0330	1251.93	1251.92	1251.91	1252.17	1251.91	1251.86	1251.89
364	0400	1251.94	1251.94	1251.92	1252.18	1251.91	1251.88	1251.90
364	0430	1251.94	1251.94	1251.93	1252.19	1251.92	1251.88	1251.91
364	0500	1251.94	1251.93	1251.93	1252.18	1251.91	1251.88	1251.91
364	0530	1251.94	1251.94	1251.93	1252.18	1251.91	1251.88	1251.91
364	0600	1251.94	1251.94	1251.93	1252.18	1251.91	1251.88	1251.91
364	0630	1251.93	1251.93	1251.92	1252.18	1251.91	1251.88	1251.91
364	0700	1251.94	1251.94	1251.93	1252.18	1251.91	1251.88	1251.92
364	0730	1251.93	1251.93	1251.92	1252.18	1251.91	1251.88	1251.91
364	0800	1251.94	1251.94	1251.93	1252.19	1251.91	1251.89	1251.91
364	0830	1251.94	1251.94	1251.94	1252.18	1251.91	1251.89	1251.92
364	0900	1251.94	1251.94	1251.93	1252.18	1251.90	1251.89	1251.91
364	0930	1251.94	1251.94	1251.93	1252.18	1251.90	1251.89	1251.92
364	1000	1251.94	1251.94	1251.93	1252.18	1251.91	1251.89	1251.92
364	1030	1251.94	1251.95	1251.94	1252.19	1251.90	1251.89	1251.92
364	1100	1251.95	1251.95	1251.94	1252.19	1251.90	1251.90	1251.93
364	1130	1251.97	1251.96	1251.96	1252.21	1251.90	1251.91	1251.95
364	1200	1251.98	1251.97	1251.97	1252.21	1251.95	1251.92	1251.96
364	1230	1252.00	1252.00	1251.99	1252.24	1251.98	1251.94	1251.97
364	1300	1252.01	1252.01	1252.00	1252.24	1251.98	1251.96	1251.98
364	1330	1252.02	1252.02	1252.01	1252.25	1251.99	1251.97	1252.00
364	1400	1252.04	1252.03	1252.03	1252.27	1251.94	1251.98	1252.01
364	1430	1252.07	1252.05	1252.05	1252.29	1251.99	1252.00	1252.03
364	1500	1252.07	1252.06	1252.06	1252.30	1252.05	1252.01	1252.04
364	1530	1252.08	1252.07	1252.08	1252.31	1252.04	1252.03	1252.06
364	1600	1252.08	1252.07	1252.08	1252.31	1252.05	1252.02	1252.06
364	1630	1252.07	1252.07	1252.07	1252.30	1252.03	1252.02	1252.06
364	1700	1252.07	1252.06	1252.06	1252.30	1252.04	1252.02	1252.06
364	1730	1252.05	1252.05	1252.05	1252.28	1252.02	1252.00	1252.04
364	1800	1252.05	1252.04	1252.05	1252.28	1252.01	1252.00	1252.04
364	1830	1252.05	1252.04	1252.05	1252.28	1252.00	1252.00	1252.04
364	1900	1252.05	1252.05	1252.05	1252.29	1252.01	1252.00	1252.04
364	1930	1252.04	1252.03	1252.04	1252.27	1252.01	1251.99	1252.03
364	2000	1252.03	1252.02	1252.03	1252.25	1251.99	1251.98	1252.03
364	2030	1252.04	1252.03	1252.03	1252.26	1251.99	1251.98	1252.03
364	2100	1252.03	1252.03	1252.04	1252.26	1252.00	1251.99	1252.03
364	2130	1252.04	1252.03	1252.03	1252.26	1251.99	1251.98	1252.03
364	2200	1252.03	1252.02	1252.03	1252.25	1251.99	1251.98	1252.03
364	2230	1252.03	1252.02	1252.03	1252.25	1251.99	1251.98	1252.03
364	2300	1252.04	1252.02	1252.03	1252.25	1251.99	1251.98	1252.03
364	2330	1252.04	1252.04	1252.05	1252.27	1252.01	1252.00	1252.04
365	0000	1252.06	1252.05	1252.06	1252.29	1252.02	1252.01	1252.05
365	0030	1252.07	1252.06	1252.07	1252.29	1252.02	1252.02	1252.06
365	0100	1252.08	1252.07	1252.08	1252.30	1252.04	1252.03	1252.07
365	0130	1252.10	1252.09	1252.10	1252.32	1252.05	1252.05	1252.09
365	0200	1252.09	1252.08	1252.09	1252.31	1252.05	1252.05	1252.09
365	0230	1252.10	1252.10	1252.10	1252.32	1252.06	1252.06	1252.10

Day of 1995	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
365	0300	1252.12	1252.11	1252.11	1252.34	1252.07	1252.07	1252.11
365	0330	1252.12	1252.12	1252.12	1252.34	1252.07	1252.08	1252.12
365	0400	1252.13	1252.12	1252.14	1252.35	1252.09	1252.09	1252.13
365	0430	1252.14	1252.13	1252.14	1252.35	1252.09	1252.09	1252.14
365	0500	1252.14	1252.13	1252.14	1252.36	1252.09	1252.10	1252.14
365	0530	1252.15	1252.15	1252.16	1252.37	1252.10	1252.11	1252.15
365	0600	1252.16	1252.15	1252.16	1252.38	1252.11	1252.11	1252.16
365	0630	1252.16	1252.15	1252.16	1252.38	1252.10	1252.11	1252.16
365	0700	1252.16	1252.15	1252.16	1252.37	1252.11	1252.11	1252.16
365	0730	1252.17	1252.16	1252.17	1252.38	1252.11	1252.12	1252.17
365	0800	1252.16	1252.16	1252.17	1252.38	1252.11	1252.12	1252.17
365	0830	1252.17	1252.16	1252.17	1252.38	1252.11	1252.13	1252.17
365	0900	1252.17	1252.16	1252.18	1252.38	1252.09	1252.13	1252.18
365	0930	1252.16	1252.15	1252.17	1252.38	1252.10	1252.12	1252.17
365	1000	1252.16	1252.15	1252.16	1252.37	1252.11	1252.11	1252.17
365	1030	1252.15	1252.14	1252.16	1252.37	1252.09	1252.11	1252.17
365	1100	1252.15	1252.14	1252.16	1252.36	1252.09	1252.11	1252.16
365	1130	1252.17	1252.16	1252.18	1252.38	1252.12	1252.13	1252.18
365	1200	1252.19	1252.18	1252.20	1252.40	1252.12	1252.15	1252.19
365	1230	1252.21	1252.20	1252.21	1252.42	1252.16	1252.16	1252.21
365	1300	1252.23	1252.22	1252.24	1252.45	1252.16	1252.19	1252.23
365	1330	1252.26	1252.24	1252.26	1252.47	1252.21	1252.21	1252.26
365	1400	1252.27	1252.26	1252.28	1252.48	1252.21	1252.23	1252.28
365	1430	1252.27	1252.26	1252.29	1252.49	1252.23	1252.24	1252.29
365	1500	1252.29	1252.28	1252.30	1252.50	1252.24	1252.25	1252.30
365	1530	1252.29	1252.27	1252.30	1252.50	1252.23	1252.25	1252.31
365	1600	1252.28	1252.27	1252.29	1252.49	1252.22	1252.24	1252.30
365	1630	1252.27	1252.26	1252.28	1252.48	1252.21	1252.23	1252.30
365	1700	1252.27	1252.25	1252.27	1252.47	1252.21	1252.22	1252.29
365	1730	1252.23	1252.21	1252.24	1252.44	1252.18	1252.20	1252.26
365	1800	1252.23	1252.22	1252.25	1252.44	1252.17	1252.20	1252.26
365	1830	1252.20	1252.20	1252.22	1252.42	1252.15	1252.18	1252.24
365	1900	1252.19	1252.18	1252.21	1252.40	1252.13	1252.16	1252.23
365	1930	1252.18	1252.16	1252.19	1252.38	1252.12	1252.15	1252.21
365	2000	1252.17	1252.15	1252.18	1252.37	1252.12	1252.13	1252.20
365	2030	1252.16	1252.15	1252.18	1252.37	1252.11	1252.13	1252.20
365	2100	1252.15	1252.13	1252.17	1252.35	1252.09	1252.12	1252.19
365	2130	1252.14	1252.12	1252.15	1252.34	1252.09	1252.11	1252.17
365	2200	1252.12	1252.11	1252.14	1252.33	1252.08	1252.10	1252.16
365	2230	1252.11	1252.09	1252.12	1252.31	1252.06	1252.09	1252.15
365	2300	1252.09	1252.07	1252.11	1252.30	1252.05	1252.07	1252.14
365	2330	1252.09	1252.07	1252.09	1252.29	1252.05	1252.06	1252.12

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
1	0000	1252.07	1252.05	1252.08	1252.27	1252.04	1252.05	1252.11
1	0030	1252.08	1252.06	1252.09	1252.28	1252.05	1252.06	1252.11
1	0100	1252.08	1252.06	1252.09	1252.29	1252.05	1252.06	1252.11
1	0130	1252.08	1252.07	1252.10	1252.29	1252.06	1252.07	1252.12
1	0200	1252.09	1252.07	1252.10	1252.29	1252.06	1252.07	1252.12

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
1	0230	1252.06	1252.05	1252.08	1252.26	1252.05	1252.06	1252.11
1	0300	1252.06	1252.04	1252.08	1252.26	1252.04	1252.05	1252.10
1	0330	1252.05	1252.03	1252.07	1252.25	1252.04	1252.04	1252.09
1	0400	1252.04	1252.02	1252.06	1252.24	1252.03	1252.03	1252.09
1	0430	1252.05	1252.03	1252.06	1252.24	1252.03	1252.03	1252.09
1	0500	1252.04	1252.02	1252.05	1252.23	1252.03	1252.03	1252.08
1	0530	1252.02	1252.00	1252.03	1252.22	1252.02	1252.01	1252.06
1	0600	1252.02	1252.00	1252.03	1252.21	1252.01	1252.01	1252.06
1	0630	1252.00	1251.99	1252.02	1252.20	1252.00	1251.99	1252.04
1	0700	1251.99	1251.97	1252.00	1252.18	1251.99	1251.98	1252.02
1	0730	1251.99	1251.96	1251.99	1252.17	1251.98	1251.97	1252.02
1	0800	1251.96	1251.95	1251.97	1252.16	1251.97	1251.96	1252.00
1	0830	1251.95	1251.94	1251.97	1252.15	1251.96	1251.95	1252.00
1	0900	1251.94	1251.92	1251.96	1252.13	1251.95	1251.94	1251.99
1	0930	1251.94	1251.93	1251.96	1252.13	1251.95	1251.93	1251.98
1	1000	1251.94	1251.92	1251.95	1252.13	1251.95	1251.94	1251.98
1	1030	1251.94	1251.92	1251.95	1252.13	1251.96	1251.94	1251.98
1	1100	1251.95	1251.93	1251.96	1252.13	1251.97	1251.95	1251.98
1	1130	1251.96	1251.94	1251.97	1252.15	1251.98	1251.95	1251.99
1	1200	1251.97	1251.95	1251.98	1252.16	1251.98	1251.96	1251.99
1	1230	1251.98	1251.97	1252.00	1252.17	1252.00	1251.98	1252.01
1	1300	1252.01	1251.98	1252.01	1252.19	1252.03	1251.99	1252.02
1	1330	1252.02	1252.00	1252.02	1252.20	1252.04	1252.01	1252.03
1	1400	1252.03	1252.00	1252.03	1252.21	1252.05	1252.02	1252.05
1	1430	1252.03	1252.00	1252.03	1252.21	1252.05	1252.02	1252.05
1	1500	1252.03	1252.01	1252.04	1252.21	1252.05	1252.02	1252.06
1	1530	1252.03	1252.00	1252.03	1252.20	1252.05	1252.02	1252.05
1	1600	1252.03	1252.00	1252.03	1252.21	1252.04	1252.02	1252.05
1	1630	1252.01	1251.99	1252.02	1252.19	1252.03	1252.00	1252.04
1	1700	1251.99	1251.98	1252.01	1252.17	1252.02	1251.99	1252.03
1	1730	1251.99	1251.97	1252.00	1252.17	1252.01	1251.98	1252.03
1	1800	1251.98	1251.97	1251.99	1252.16	1252.01	1251.98	1252.02
1	1830	1251.98	1251.96	1251.98	1252.15	1251.99	1251.98	1252.01
1	1900	1251.97	1251.95	1251.97	1252.13	1252.00	1251.96	1251.99
1	1930	1251.96	1251.95	1251.97	1252.14	1251.99	1251.96	1252.00
1	2000	1251.97	1251.95	1251.97	1252.14	1252.00	1251.96	1251.99
1	2030	1251.97	1251.95	1251.98	1252.14	1251.99	1251.96	1252.00
1	2100	1251.97	1251.95	1251.98	1252.14	1251.99	1251.96	1251.99
1	2130	1251.97	1251.95	1251.97	1252.14	1252.00	1251.96	1252.00
1	2200	1251.97	1251.96	1251.98	1252.14	1252.00	1251.97	1252.00
1	2230	1251.97	1251.96	1251.98	1252.14	1252.00	1251.97	1252.00
1	2300	1251.98	1251.96	1251.98	1252.14	1252.01	1251.97	1252.00
1	2330	1251.97	1251.95	1251.98	1252.14	1252.00	1251.97	1251.99
2	0000	1251.98	1251.95	1251.98	1252.14	1252.01	1251.96	1251.99
2	0030	1251.98	1251.96	1251.98	1252.14	1252.01	1251.97	1251.99
2	0100	1251.98	1251.96	1251.98	1252.14	1252.02	1251.97	1251.99
2	0130	1251.99	1251.97	1251.99	1252.14	1252.02	1251.98	1252.00
2	0200	1251.98	1251.96	1251.98	1252.14	1252.01	1251.98	1252.00
2	0230	1251.98	1251.96	1251.98	1252.14	1252.02	1251.97	1252.00
2	0300	1251.97	1251.95	1251.97	1252.12	1252.00	1251.96	1251.99
2	0330	1251.97	1251.95	1251.97	1252.12	1252.00	1251.96	1251.99

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
2	0400	1251.97	1251.95	1251.97	1252.12	1252.00	1251.97	1251.99
2	0430	1251.97	1251.95	1251.97	1252.12	1252.01	1251.97	1251.99
2	0500	1251.96	1251.95	1251.97	1252.12	1252.00	1251.96	1251.99
2	0530	1251.95	1251.94	1251.95	1252.10	1251.99	1251.94	1251.97
2	0600	1251.95	1251.94	1251.96	1252.10	1251.99	1251.94	1251.97
2	0630	1251.94	1251.93	1251.95	1252.10	1251.98	1251.94	1251.97
2	0700	1251.93	1251.92	1251.93	1252.08	1251.97	1251.93	1251.95
2	0730	1251.92	1251.91	1251.92	1252.06	1251.96	1251.91	1251.94
2	0800	1251.93	1251.91	1251.93	1252.07	1251.97	1251.92	1251.94
2	0830	1251.92	1251.91	1251.92	1252.06	1251.96	1251.91	1251.93
2	0900	1251.90	1251.89	1251.91	1252.05	1251.96	1251.90	1251.92
2	0930	1251.89	1251.88	1251.90	1252.04	1251.95	1251.88	1251.91
2	1000	1251.88	1251.87	1251.89	1252.03	1251.93	1251.88	1251.90
2	1030	1251.87	1251.86	1251.87	1252.01	1251.93	1251.86	1251.89
2	1100	1251.87	1251.85	1251.86	1252.01	1251.92	1251.86	1251.88
2	1130	1251.87	1251.86	1251.86	1252.01	1251.91	1251.87	1251.88
2	1200	1251.88	1251.87	1251.89	1252.03	1251.94	1251.87	1251.90
2	1230	1251.90	1251.89	1251.90	1252.04	1251.94	1251.89	1251.90
2	1300	1251.91	1251.90	1251.91	1252.05	1251.96	1251.90	1251.91
2	1330	1251.93	1251.92	1251.93	1252.07	1251.98	1251.92	1251.93
2	1400	1251.93	1251.92	1251.93	1252.07	1252.00	1251.93	1251.94
2	1430	1251.93	1251.92	1251.93	1252.06	1251.98	1251.92	1251.93
2	1500	1251.93	1251.92	1251.92	1252.05	1251.98	1251.92	1251.93
2	1530	1251.92	1251.91	1251.92	1252.05	1251.98	1251.91	1251.92
2	1600	1251.92	1251.91	1251.92	1252.05	1251.98	1251.91	1251.92
2	1630	1251.92	1251.91	1251.93	1252.05	1251.98	1251.91	1251.92
2	1700	1251.93	1251.92	1251.92	1252.05	1251.98	1251.91	1251.92
2	1730	1251.92	1251.91	1251.92	1252.05	1251.98	1251.92	1251.92
2	1800	1251.92	1251.91	1251.92	1252.04	1251.98	1251.91	1251.92
2	1830	1251.92	1251.91	1251.92	1252.04	1251.98	1251.91	1251.92
2	1900	1251.91	1251.90	1251.91	1252.04	1251.98	1251.91	1251.91
2	1930	1251.91	1251.90	1251.90	1252.03	1251.97	1251.90	1251.91
2	2000	1251.90	1251.89	1251.90	1252.03	1251.96	1251.90	1251.90
2	2030	1251.90	1251.89	1251.90	1252.03	1251.97	1251.89	1251.90
2	2100	1251.90	1251.89	1251.90	1252.03	1251.97	1251.89	1251.90
2	2130	1251.90	1251.89	1251.90	1252.02	1251.96	1251.89	1251.90
2	2200	1251.90	1251.89	1251.89	1252.02	1251.97	1251.89	1251.90
2	2230	1251.90	1251.89	1251.89	1252.02	1251.97	1251.89	1251.89
2	2300	1251.90	1251.89	1251.89	1252.02	1251.96	1251.89	1251.90
2	2330	1251.90	1251.89	1251.90	1252.02	1251.97	1251.90	1251.90
3	0000	1251.90	1251.90	1251.90	1252.03	1251.97	1251.90	1251.90
3	0030	1251.92	1251.91	1251.91	1252.03	1251.98	1251.90	1251.91
3	0100	1251.92	1251.91	1251.91	1252.03	1251.98	1251.90	1251.91
3	0130	1251.92	1251.91	1251.91	1252.03	1251.98	1251.91	1251.91
3	0200	1251.92	1251.91	1251.91	1252.03	1251.98	1251.90	1251.90
3	0230	1251.92	1251.92	1251.92	1252.03	1251.98	1251.91	1251.91
3	0300	1251.93	1251.92	1251.92	1252.04	1251.98	1251.91	1251.91
3	0330	1251.93	1251.92	1251.93	1252.04	1252.00	1251.92	1251.92
3	0400	1251.95	1251.94	1251.94	1252.05	1252.01	1251.93	1251.93
3	0430	1251.96	1251.95	1251.95	1252.07	1252.02	1251.94	1251.94
3	0500	1251.97	1251.96	1251.96	1252.07	1252.02	1251.95	1251.95

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
3	0530	1251.98	1251.97	1251.97	1252.08	1252.04	1251.96	1251.96
3	0600	1251.98	1251.97	1251.97	1252.08	1252.04	1251.96	1251.96
3	0630	1251.96	1251.95	1251.95	1252.07	1252.02	1251.95	1251.95
3	0700	1251.96	1251.95	1251.95	1252.06	1252.02	1251.94	1251.95
3	0730	1251.96	1251.96	1251.96	1252.07	1252.02	1251.95	1251.95
3	0800	1251.96	1251.95	1251.95	1252.07	1252.02	1251.95	1251.95
3	0830	1251.96	1251.95	1251.95	1252.07	1252.02	1251.95	1251.95
3	0900	1251.97	1251.96	1251.96	1252.07	1252.02	1251.95	1251.96
3	0930	1251.99	1251.98	1251.98	1252.09	1252.05	1251.97	1251.97
3	1000	1251.99	1251.99	1251.98	1252.09	1251.99	1251.98	1251.98
3	1030	1252.01	1252.00	1252.00	1252.11	1252.10	1251.98	1251.99
3	1100	1252.01	1252.01	1252.01	1252.11	1252.02	1251.99	1252.00
3	1130	1252.04	1252.04	1252.03	1252.14	1252.06	1252.02	1252.02
3	1200	1252.09	1252.06	1252.06	1252.16	1252.11	1252.04	1252.04
3	1230	1252.09	1252.08	1252.07	1252.18	1252.12	1252.06	1252.06
3	1300	1252.12	1252.11	1252.11	1252.21	1252.14	1252.10	1252.09
3	1330	1252.15	1252.14	1252.14	1252.24	1252.18	1252.12	1252.12
3	1400	1252.17	1252.16	1252.16	1252.26	1252.20	1252.14	1252.15
3	1430	1252.19	1252.18	1252.18	1252.29	1252.22	1252.16	1252.16
3	1500	1252.19	1252.19	1252.18	1252.28	1252.20	1252.16	1252.17
3	1530	1252.20	1252.20	1252.20	1252.29	1252.28	1252.18	1252.18
3	1600	1252.20	1252.20	1252.19	1252.29	1252.23	1252.18	1252.19
3	1630	1252.20	1252.20	1252.20	1252.30	1252.23	1252.18	1252.20
3	1700	1252.21	1252.21	1252.20	1252.30	1252.23	1252.18	1252.20
3	1730	1252.21	1252.22	1252.22	1252.31	1252.24	1252.19	1252.20
3	1800	1252.21	1252.22	1252.22	1252.31	1252.23	1252.19	1252.21
3	1830	1252.24	1252.24	1252.24	1252.33	1252.25	1252.21	1252.23
3	1900	1252.25	1252.25	1252.25	1252.34	1252.26	1252.23	1252.24
3	1930	1252.28	1252.29	1252.29	1252.38	1252.28	1252.26	1252.27
3	2000	1252.30	1252.30	1252.30	1252.39	1252.30	1252.28	1252.29
3	2030	1252.29	1252.29	1252.29	1252.38	1252.30	1252.27	1252.29
3	2100	1252.29	1252.29	1252.29	1252.38	1252.29	1252.27	1252.29
3	2130	1252.30	1252.30	1252.30	1252.39	1252.30	1252.27	1252.30
3	2200	1252.30	1252.30	1252.30	1252.40	1252.30	1252.28	1252.30
3	2230	1252.31	1252.31	1252.31	1252.41	1252.30	1252.29	1252.31
3	2300	1252.32	1252.31	1252.32	1252.41	1252.31	1252.29	1252.32
3	2330	1252.32	1252.32	1252.33	1252.42	1252.31	1252.30	1252.33
4	0000	1252.33	1252.33	1252.33	1252.42	1252.32	1252.31	1252.34
4	0030	1252.32	1252.32	1252.33	1252.42	1252.31	1252.31	1252.34
4	0100	1252.33	1252.33	1252.33	1252.42	1252.32	1252.31	1252.34
4	0130	1252.32	1252.32	1252.33	1252.42	1252.31	1252.30	1252.34
4	0200	1252.31	1252.31	1252.32	1252.40	1252.30	1252.30	1252.33
4	0230	1252.30	1252.30	1252.31	1252.40	1252.30	1252.29	1252.32
4	0300	1252.29	1252.29	1252.30	1252.39	1252.29	1252.28	1252.31
4	0330	1252.29	1252.29	1252.30	1252.38	1252.29	1252.28	1252.32
4	0400	1252.29	1252.29	1252.31	1252.38	1252.28	1252.28	1252.31
4	0430	1252.28	1252.28	1252.30	1252.38	1252.28	1252.27	1252.30
4	0500	1252.28	1252.28	1252.30	1252.37	1252.28	1252.26	1252.30
4	0530	1252.26	1252.25	1252.27	1252.35	1252.26	1252.25	1252.29
4	0600	1252.24	1252.24	1252.26	1252.34	1252.24	1252.23	1252.27
4	0630	1252.23	1252.22	1252.24	1252.32	1252.23	1252.21	1252.25

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
4	0700	1252.21	1252.21	1252.22	1252.30	1252.21	1252.19	1252.24
4	0730	1252.19	1252.18	1252.20	1252.28	1252.20	1252.18	1252.22
4	0800	1252.17	1252.16	1252.18	1252.26	1252.17	1252.16	1252.20
4	0830	1252.15	1252.15	1252.17	1252.24	1252.14	1252.14	1252.18
4	0900	1252.12	1252.12	1252.13	1252.21	1252.11	1252.11	1252.16
4	0930	1252.09	1252.09	1252.10	1252.19	1252.09	1252.09	1252.13
4	1000	1252.09	1252.07	1252.08	1252.17	1252.06	1252.07	1252.11
4	1030	1252.07	1252.05	1252.07	1252.15	1252.07	1252.06	1252.09
4	1100	1252.03	1252.03	1252.05	1252.12	1252.04	1252.03	1252.07
4	1130	1252.02	1252.01	1252.03	1252.11	1252.03	1252.02	1252.05
4	1200	1252.02	1252.01	1252.03	1252.11	1252.05	1252.01	1252.05
4	1230	1252.02	1252.01	1252.03	1252.10	1252.05	1252.01	1252.04
4	1300	1252.01	1252.00	1252.02	1252.10	1252.04	1252.01	1252.04
4	1330	1252.02	1252.00	1252.02	1252.10	1252.05	1252.01	1252.03
4	1400	1252.01	1252.00	1252.01	1252.09	1252.05	1252.00	1252.03
4	1430	1252.00	1251.98	1252.00	1252.07	1252.02	1251.99	1252.01
4	1500	1251.98	1251.97	1251.99	1252.07	1252.02	1251.98	1252.00
4	1530	1251.97	1251.96	1251.97	1252.05	1252.05	1251.97	1251.99
4	1600	1251.96	1251.95	1251.97	1252.04	1252.02	1251.96	1251.98
4	1630	1251.95	1251.94	1251.95	1252.03	1252.01	1251.95	1251.97
4	1700	1251.93	1251.92	1251.94	1252.01	1251.99	1251.93	1251.95
4	1730	1251.91	1251.91	1251.92	1252.00	1251.99	1251.92	1251.94
4	1800	1251.90	1251.89	1251.91	1251.98	1251.96	1251.91	1251.92
4	1830	1251.89	1251.88	1251.89	1251.96	1251.96	1251.90	1251.91
4	1900	1251.87	1251.87	1251.87	1251.94	1251.94	1251.88	1251.89
4	1930	1251.86	1251.86	1251.86	1251.94	1251.94	1251.87	1251.88
4	2000	1251.86	1251.85	1251.85	1251.92	1251.93	1251.85	1251.87
4	2030	1251.84	1251.84	1251.84	1251.91	1251.92	1251.84	1251.85
4	2100	1251.83	1251.82	1251.82	1251.90	1251.90	1251.83	1251.84
4	2130	1251.82	1251.81	1251.82	1251.88	1251.89	1251.82	1251.83
4	2200	1251.82	1251.81	1251.81	1251.88	1251.89	1251.82	1251.82
4	2230	1251.80	1251.79	1251.80	1251.87	1251.89	1251.81	1251.81
4	2300	1251.80	1251.79	1251.80	1251.87	1251.90	1251.80	1251.81
4	2330	1251.80	1251.80	1251.80	1251.87	1251.89	1251.81	1251.81
5	0000	1251.82	1251.81	1251.81	1251.87	1251.90	1251.81	1251.81
5	0030	1251.83	1251.82	1251.82	1251.89	1251.92	1251.82	1251.82
5	0100	1251.82	1251.81	1251.81	1251.88	1251.92	1251.82	1251.82
5	0130	1251.83	1251.82	1251.82	1251.88	1251.91	1251.82	1251.82
5	0200	1251.83	1251.82	1251.82	1251.89	1251.93	1251.83	1251.82
5	0230	1251.82	1251.81	1251.81	1251.88	1251.92	1251.82	1251.81
5	0300	1251.81	1251.80	1251.80	1251.87	1251.91	1251.81	1251.80
5	0330	1251.79	1251.78	1251.78	1251.85	1251.89	1251.79	1251.79
5	0400	1251.77	1251.77	1251.76	1251.83	1251.87	1251.77	1251.77
5	0430	1251.78	1251.77	1251.77	1251.83	1251.87	1251.78	1251.76
5	0500	1251.78	1251.77	1251.76	1251.82	1251.88	1251.78	1251.76
5	0530	1251.78	1251.77	1251.77	1251.83	1251.88	1251.77	1251.76
5	0600	1251.77	1251.76	1251.76	1251.82	1251.87	1251.77	1251.75
5	0630	1251.77	1251.76	1251.76	1251.82	1251.87	1251.77	1251.75
5	0700	1251.77	1251.76	1251.75	1251.82	1251.87	1251.76	1251.74
5	0730	1251.77	1251.76	1251.75	1251.81	1251.87	1251.76	1251.75
5	0800	1251.77	1251.76	1251.75	1251.81	1251.87	1251.76	1251.74

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
5	0830	1251.76	1251.75	1251.75	1251.81	1251.87	1251.76	1251.74
5	0900	1251.74	1251.73	1251.73	1251.79	1251.85	1251.74	1251.72
5	0930	1251.73	1251.73	1251.72	1251.78	1251.84	1251.73	1251.71
5	1000	1251.73	1251.73	1251.71	1251.78	1251.83	1251.73	1251.71
5	1030	1251.74	1251.73	1251.73	1251.78	1251.85	1251.73	1251.71
5	1100	1251.74	1251.74	1251.73	1251.78	1251.85	1251.74	1251.71
5	1130	1251.76	1251.75	1251.74	1251.79	1251.86	1251.74	1251.72
5	1200	1251.77	1251.77	1251.75	1251.81	1251.86	1251.76	1251.74
5	1230	1251.78	1251.79	1251.77	1251.82	1251.89	1251.77	1251.74
5	1300	1251.81	1251.81	1251.79	1251.84	1251.93	1251.80	1251.76
5	1330	1251.83	1251.83	1251.80	1251.86	1251.94	1251.81	1251.78
5	1400	1251.83	1251.84	1251.82	1251.87	1251.94	1251.82	1251.79
5	1430	1251.85	1251.84	1251.82	1251.87	1251.95	1251.83	1251.80
5	1500	1251.85	1251.85	1251.82	1251.88	1251.96	1251.83	1251.80
5	1530	1251.85	1251.85	1251.83	1251.88	1251.96	1251.83	1251.81
5	1600	1251.86	1251.86	1251.84	1251.89	1251.96	1251.85	1251.81
5	1630	1251.86	1251.86	1251.84	1251.89	1251.97	1251.84	1251.82
5	1700	1251.85	1251.85	1251.83	1251.88	1251.95	1251.83	1251.81
5	1730	1251.84	1251.84	1251.82	1251.87	1251.94	1251.82	1251.80
5	1800	1251.83	1251.84	1251.81	1251.87	1251.93	1251.82	1251.79
5	1830	1251.82	1251.82	1251.80	1251.84	1251.92	1251.80	1251.78
5	1900	1251.82	1251.83	1251.80	1251.85	1251.92	1251.80	1251.78
5	1930	1251.83	1251.84	1251.81	1251.86	1251.93	1251.81	1251.78
5	2000	1251.84	1251.84	1251.81	1251.86	1251.94	1251.82	1251.79
5	2030	1251.83	1251.84	1251.81	1251.86	1251.94	1251.81	1251.78
5	2100	1251.83	1251.83	1251.80	1251.85	1251.93	1251.81	1251.78
5	2130	1251.82	1251.82	1251.80	1251.84	1251.93	1251.80	1251.78
5	2200	1251.81	1251.81	1251.78	1251.82	1251.90	1251.79	1251.76
5	2230	1251.80	1251.80	1251.78	1251.82	1251.90	1251.78	1251.75
5	2300	1251.79	1251.80	1251.77	1251.81	1251.90	1251.77	1251.75
5	2330	1251.79	1251.80	1251.77	1251.81	1251.90	1251.77	1251.74
6	0000	1251.80	1251.80	1251.77	1251.82	1251.90	1251.78	1251.74
6	0030	1251.80	1251.80	1251.77	1251.82	1251.90	1251.78	1251.74
6	0100	1251.79	1251.80	1251.77	1251.81	1251.90	1251.77	1251.74
6	0130	1251.79	1251.80	1251.77	1251.81	1251.90	1251.77	1251.74
6	0200	1251.79	1251.80	1251.76	1251.80	1251.90	1251.77	1251.74
6	0230	1251.78	1251.79	1251.76	1251.79	1251.89	1251.77	1251.73
6	0300	1251.79	1251.80	1251.77	1251.81	1251.89	1251.77	1251.74
6	0330	1251.79	1251.80	1251.77	1251.81	1251.90	1251.77	1251.74
6	0400	1251.79	1251.80	1251.76	1251.80	1251.90	1251.77	1251.73
6	0430	1251.79	1251.79	1251.77	1251.80	1251.90	1251.77	1251.73
6	0500	1251.79	1251.80	1251.76	1251.80	1251.90	1251.77	1251.73
6	0530	1251.80	1251.80	1251.77	1251.81	1251.92	1251.77	1251.74
6	0600	1251.79	1251.80	1251.77	1251.81	1251.92	1251.78	1251.74
6	0630	1251.79	1251.79	1251.76	1251.79	1251.91	1251.77	1251.73
6	0700	1251.77	1251.78	1251.75	1251.78	1251.90	1251.76	1251.72
6	0730	1251.76	1251.77	1251.73	1251.77	1251.88	1251.74	1251.70
6	0800	1251.76	1251.76	1251.73	1251.77	1251.88	1251.74	1251.69
6	0830	1251.75	1251.76	1251.73	1251.76	1251.88	1251.74	1251.69
6	0900	1251.75	1251.76	1251.73	1251.76	1251.87	1251.73	1251.68
6	0930	1251.75	1251.76	1251.73	1251.75	1251.88	1251.73	1251.69

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
6	1000	1251.74	1251.75	1251.72	1251.75	1251.86	1251.72	1251.68
6	1030	1251.74	1251.74	1251.71	1251.74	1251.84	1251.71	1251.67
6	1100	1251.73	1251.74	1251.70	1251.73	1251.84	1251.70	1251.67
6	1130	1251.74	1251.75	1251.71	1251.75	1251.85	1251.71	1251.67
6	1200	1251.76	1251.77	1251.73	1251.76	1251.87	1251.73	1251.68
6	1230	1251.77	1251.78	1251.75	1251.78	1251.89	1251.74	1251.69
6	1300	1251.78	1251.80	1251.76	1251.79	1251.84	1251.76	1251.71
6	1330	1251.80	1251.81	1251.77	1251.80	1251.89	1251.77	1251.73
6	1400	1251.82	1251.83	1251.78	1251.82	1251.96	1251.78	1251.74
6	1430	1251.81	1251.82	1251.78	1251.81	1251.90	1251.78	1251.74
6	1500	1251.81	1251.82	1251.78	1251.81	1251.90	1251.78	1251.74
6	1530	1251.82	1251.83	1251.78	1251.82	1251.94	1251.78	1251.74
6	1600	1251.82	1251.83	1251.78	1251.81	1251.91	1251.78	1251.74
6	1630	1251.81	1251.82	1251.78	1251.81	1251.90	1251.78	1251.74
6	1700	1251.80	1251.81	1251.77	1251.80	1251.93	1251.77	1251.74
6	1730	1251.80	1251.81	1251.77	1251.79	1251.93	1251.77	1251.72
6	1800	1251.79	1251.80	1251.76	1251.79	1251.91	1251.76	1251.72
6	1830	1251.79	1251.80	1251.76	1251.78	1251.91	1251.76	1251.71
6	1900	1251.79	1251.80	1251.76	1251.78	1251.91	1251.76	1251.71
6	1930	1251.78	1251.80	1251.75	1251.78	1251.90	1251.76	1251.71
6	2000	1251.78	1251.79	1251.75	1251.77	1251.90	1251.75	1251.70
6	2030	1251.77	1251.78	1251.74	1251.76	1251.89	1251.75	1251.69
6	2100	1251.76	1251.77	1251.73	1251.75	1251.89	1251.74	1251.69
6	2130	1251.76	1251.77	1251.72	1251.74	1251.88	1251.73	1251.68
6	2200	1251.76	1251.78	1251.73	1251.75	1251.89	1251.74	1251.69
6	2230	1251.76	1251.78	1251.73	1251.75	1251.90	1251.74	1251.69
6	2300	1251.76	1251.77	1251.73	1251.75	1251.89	1251.74	1251.68
6	2330	1251.76	1251.77	1251.73	1251.75	1251.89	1251.74	1251.68
7	0000	1251.76	1251.77	1251.73	1251.75	1251.89	1251.73	1251.68
7	0030	1251.76	1251.77	1251.73	1251.75	1251.89	1251.73	1251.68
7	0100	1251.76	1251.78	1251.73	1251.75	1251.90	1251.74	1251.68
7	0130	1251.77	1251.79	1251.74	1251.77	1251.91	1251.75	1251.69
7	0200	1251.77	1251.78	1251.74	1251.76	1251.90	1251.75	1251.69
7	0230	1251.77	1251.78	1251.74	1251.76	1251.90	1251.75	1251.68
7	0300	1251.77	1251.78	1251.74	1251.76	1251.90	1251.74	1251.69
7	0330	1251.77	1251.78	1251.74	1251.76	1251.90	1251.74	1251.69
7	0400	1251.77	1251.79	1251.74	1251.76	1251.90	1251.74	1251.69
7	0430	1251.78	1251.79	1251.75	1251.77	1251.90	1251.75	1251.69
7	0500	1251.77	1251.79	1251.75	1251.76	1251.90	1251.74	1251.69
7	0530	1251.78	1251.79	1251.75	1251.76	1251.90	1251.74	1251.69
7	0600	1251.78	1251.79	1251.75	1251.77	1251.90	1251.75	1251.69
7	0630	1251.77	1251.79	1251.74	1251.76	1251.90	1251.74	1251.69
7	0700	1251.77	1251.78	1251.73	1251.75	1251.88	1251.73	1251.68
7	0730	1251.75	1251.77	1251.72	1251.74	1251.88	1251.73	1251.68
7	0800	1251.75	1251.76	1251.72	1251.73	1251.87	1251.72	1251.67
7	0830	1251.75	1251.76	1251.71	1251.72	1251.85	1251.72	1251.66
7	0900	1251.74	1251.75	1251.70	1251.72	1251.82	1251.71	1251.65
7	0930	1251.72	1251.74	1251.69	1251.70	1251.82	1251.70	1251.64
7	1000	1251.71	1251.74	1251.68	1251.70	1251.82	1251.69	1251.64
7	1030	1251.71	1251.73	1251.68	1251.69	1251.82	1251.68	1251.63
7	1100	1251.72	1251.73	1251.69	1251.70	1251.82	1251.68	1251.63

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
7	1130	1251.74	1251.75	1251.70	1251.72	1251.83	1251.70	1251.64
7	1200	1251.74	1251.76	1251.71	1251.72	1251.84	1251.70	1251.65
7	1230	1251.76	1251.78	1251.73	1251.73	1251.85	1251.71	1251.66
7	1300	1251.79	1251.80	1251.75	1251.76	1251.91	1251.74	1251.68
7	1330	1251.81	1251.83	1251.78	1251.79	1251.90	1251.76	1251.71
7	1400	1251.82	1251.84	1251.78	1251.80	1251.92	1251.77	1251.72
7	1430	1251.82	1251.84	1251.78	1251.79	1251.92	1251.77	1251.73
7	1500	1251.83	1251.84	1251.79	1251.81	1251.91	1251.78	1251.74
7	1530	1251.84	1251.85	1251.80	1251.82	1251.94	1251.79	1251.74
7	1600	1251.84	1251.86	1251.81	1251.82	1251.96	1251.80	1251.75
7	1630	1251.84	1251.86	1251.80	1251.82	1251.93	1251.79	1251.75
7	1700	1251.85	1251.87	1251.82	1251.83	1251.98	1251.80	1251.76
7	1730	1251.84	1251.85	1251.80	1251.81	1251.96	1251.80	1251.75
7	1800	1251.85	1251.87	1251.81	1251.82	1251.95	1251.80	1251.76
7	1830	1251.86	1251.88	1251.83	1251.83	1251.97	1251.82	1251.77
7	1900	1251.87	1251.90	1251.85	1251.85	1251.98	1251.83	1251.78
7	1930	1251.87	1251.89	1251.84	1251.85	1251.99	1251.83	1251.78
7	2000	1251.87	1251.89	1251.84	1251.85	1251.98	1251.83	1251.78
7	2030	1251.89	1251.91	1251.86	1251.87	1251.99	1251.85	1251.80
7	2100	1251.89	1251.91	1251.86	1251.87	1251.99	1251.85	1251.80
7	2130	1251.90	1251.92	1251.87	1251.87	1252.00	1251.86	1251.81
7	2200	1251.89	1251.91	1251.85	1251.86	1252.00	1251.85	1251.80
7	2230	1251.89	1251.91	1251.86	1251.86	1251.98	1251.85	1251.80
7	2300	1251.89	1251.91	1251.86	1251.87	1251.99	1251.86	1251.80
7	2330	1251.89	1251.91	1251.86	1251.87	1251.99	1251.85	1251.81
8	0000	1251.91	1251.93	1251.88	1251.89	1252.01	1251.87	1251.82
8	0030	1251.93	1251.95	1251.90	1251.90	1252.03	1251.89	1251.84
8	0100	1251.94	1251.96	1251.92	1251.92	1252.04	1251.91	1251.85
8	0130	1251.95	1251.97	1251.93	1251.93	1252.05	1251.91	1251.86
8	0200	1251.97	1251.98	1251.94	1251.94	1252.07	1251.92	1251.87
8	0230	1251.98	1252.00	1251.95	1251.95	1252.07	1251.94	1251.89
8	0300	1251.98	1252.00	1251.95	1251.95	1252.07	1251.94	1251.89
8	0330	1251.99	1252.01	1251.96	1251.96	1252.06	1251.95	1251.90
8	0400	1252.01	1252.03	1251.98	1251.99	1252.09	1251.96	1251.92
8	0430	1252.02	1252.04	1252.00	1252.00	1252.11	1251.98	1251.93
8	0500	1252.03	1252.05	1252.01	1252.01	1252.12	1251.99	1251.95
8	0530	1252.04	1252.06	1252.01	1252.01	1252.12	1252.00	1251.96
8	0600	1252.04	1252.06	1252.02	1252.02	1252.12	1252.00	1251.96
8	0630	1252.05	1252.06	1252.02	1252.02	1252.12	1252.00	1251.96
8	0700	1252.04	1252.06	1252.02	1252.01	1252.12	1252.00	1251.97
8	0730	1252.05	1252.06	1252.02	1252.02	1252.12	1252.00	1251.97
8	0800	1252.04	1252.07	1252.03	1252.03	1252.11	1252.01	1251.98
8	0830	1252.06	1252.08	1252.04	1252.04	1252.11	1252.02	1251.99
8	0900	1252.06	1252.08	1252.03	1252.03	1252.10	1252.02	1251.99
8	0930	1252.06	1252.08	1252.05	1252.05	1252.09	1252.02	1251.99
8	1000	1252.08	1252.10	1252.05	1252.05	1252.09	1252.03	1252.00
8	1030	1252.09	1252.11	1252.07	1252.07	1252.11	1252.05	1252.02
8	1100	1252.11	1252.13	1252.09	1252.09	1252.16	1252.06	1252.03
8	1130	1252.14	1252.15	1252.12	1252.12	1252.20	1252.08	1252.06
8	1200	1252.17	1252.19	1252.14	1252.15	1252.22	1252.11	1252.08
8	1230	1252.20	1252.22	1252.18	1252.18	1252.26	1252.14	1252.11

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
8	1300	1252.22	1252.24	1252.20	1252.21	1252.26	1252.16	1252.13
8	1330	1252.24	1252.26	1252.23	1252.22	1252.28	1252.18	1252.16
8	1400	1252.28	1252.29	1252.25	1252.25	1252.29	1252.21	1252.19
8	1430	1252.28	1252.30	1252.27	1252.27	1252.30	1252.23	1252.21
8	1500	1252.29	1252.32	1252.28	1252.27	1252.32	1252.24	1252.22
8	1530	1252.30	1252.32	1252.28	1252.27	1252.30	1252.25	1252.23
8	1600	1252.29	1252.31	1252.28	1252.27	1252.30	1252.24	1252.23
8	1630	1252.29	1252.31	1252.28	1252.28	1252.33	1252.24	1252.24
8	1700	1252.28	1252.31	1252.28	1252.27	1252.28	1252.24	1252.24
8	1730	1252.29	1252.30	1252.28	1252.27	1252.32	1252.24	1252.24
8	1800	1252.28	1252.30	1252.27	1252.27	1252.29	1252.23	1252.24
8	1830	1252.29	1252.30	1252.28	1252.27	1252.29	1252.24	1252.24
8	1900	1252.28	1252.30	1252.27	1252.27	1252.28	1252.23	1252.24
8	1930	1252.27	1252.29	1252.27	1252.26	1252.28	1252.23	1252.24
8	2000	1252.27	1252.29	1252.27	1252.25	1252.27	1252.22	1252.23
8	2030	1252.27	1252.29	1252.26	1252.25	1252.27	1252.22	1252.23
8	2100	1252.26	1252.28	1252.26	1252.25	1252.26	1252.22	1252.23
8	2130	1252.26	1252.28	1252.26	1252.25	1252.27	1252.22	1252.24
8	2200	1252.26	1252.28	1252.26	1252.25	1252.26	1252.22	1252.23
8	2230	1252.26	1252.28	1252.26	1252.25	1252.27	1252.22	1252.24
8	2300	1252.27	1252.28	1252.26	1252.25	1252.27	1252.23	1252.24
8	2330	1252.26	1252.27	1252.26	1252.25	1252.26	1252.22	1252.24
9	0000	1252.27	1252.28	1252.27	1252.25	1252.27	1252.23	1252.24
9	0030	1252.26	1252.29	1252.28	1252.27	1252.28	1252.24	1252.25
9	0100	1252.28	1252.30	1252.28	1252.28	1252.29	1252.24	1252.25
9	0130	1252.27	1252.28	1252.27	1252.27	1252.28	1252.24	1252.25
9	0200	1252.26	1252.28	1252.27	1252.25	1252.26	1252.23	1252.25
9	0230	1252.24	1252.25	1252.24	1252.24	1252.23	1252.21	1252.23
9	0300	1252.24	1252.25	1252.24	1252.24	1252.25	1252.21	1252.23
9	0330	1252.24	1252.25	1252.24	1252.23	1252.25	1252.20	1252.22
9	0400	1252.23	1252.25	1252.24	1252.23	1252.25	1252.20	1252.22
9	0430	1252.24	1252.25	1252.24	1252.24	1252.24	1252.21	1252.22
9	0500	1252.23	1252.24	1252.23	1252.22	1252.24	1252.20	1252.21
9	0530	1252.21	1252.22	1252.21	1252.21	1252.22	1252.18	1252.20
9	0600	1252.20	1252.21	1252.20	1252.20	1252.22	1252.17	1252.20
9	0630	1252.18	1252.19	1252.18	1252.18	1252.19	1252.15	1252.18
9	0700	1252.17	1252.18	1252.17	1252.16	1252.18	1252.14	1252.17
9	0730	1252.14	1252.16	1252.15	1252.14	1252.14	1252.12	1252.15
9	0800	1252.14	1252.15	1252.14	1252.13	1252.15	1252.11	1252.14
9	0830	1252.12	1252.13	1252.12	1252.12	1252.10	1252.10	1252.12
9	0900	1252.11	1252.11	1252.11	1252.11	1252.11	1252.11	1252.11
44	1600	1246.89	1246.43	1246.29	1248.57	1242.64	1243.84	1249.33
44	1800	1246.88	1246.42	1246.29	1248.57	1242.67	1243.82	1249.32
44	2000	1246.83	1246.37	1246.24	1248.53	1242.55	1243.79	1249.28
44	2200	1246.80	1246.34	1246.21	1248.51	1242.53	1243.77	1249.25
45	0000	1246.81	1246.35	1246.22	1248.53	1242.56	1243.78	1249.24
45	0200	1246.82	1246.36	1246.24	1248.55	1242.50	1243.79	1249.26
45	0400	1246.82	1246.36	1246.24	1248.55	1242.49	1243.79	1249.26
45	0600	1246.80	1246.34	1246.22	1248.54	1242.47	1243.79	1249.24
45	0800	1246.78	1246.33	1246.21	1248.54	1242.44	1243.79	1249.24

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
45	1000	1246.77	1246.31	1246.19	1248.52	1242.42	1243.77	1249.22
45	1200	1246.76	1246.30	1246.19	1248.52	1242.41	1243.77	1249.21
45	1400	1247.21	1246.79	1246.73	1248.77	1245.13	1245.99	1249.24
45	1600	1247.25	1246.83	1246.35	1248.70	1244.90	1244.28	1249.27
45	1800	1248.05	1247.67	1247.60	1249.13	1247.05	1247.34	1249.35
45	2000	1248.47	1248.15	1248.16	1249.42	1247.62	1247.99	1249.44
45	2200	1248.76	1248.49	1248.53	1249.65	1247.98	1248.35	1249.57
46	0000	1248.94	1248.73	1248.77	1249.81	1248.24	1248.59	1249.67
46	0200	1249.13	1248.94	1249.00	1249.97	1248.47	1248.82	1249.79
46	0400	1249.29	1249.12	1249.19	1250.11	1248.69	1249.02	1249.91
46	0600	1249.40	1249.24	1249.31	1250.19	1248.84	1249.16	1249.98
46	0800	1249.37	1249.28	1249.34	1250.14	1248.40	1249.15	1249.87
46	1000	1248.74	1248.91	1248.71	1249.78	1244.97	1245.83	1249.82
46	1200	1248.15	1248.16	1247.99	1249.45	1244.34	1245.22	1249.75
46	1400	1247.83	1247.74	1247.56	1249.26	1243.95	1244.93	1249.67
46	1600	1247.61	1247.45	1247.27	1249.09	1243.73	1244.73	1249.57
46	1800	1247.39	1247.19	1247.01	1248.91	1243.52	1244.55	1249.43
46	2000	1247.17	1246.93	1246.74	1248.70	1243.27	1244.37	1249.24
46	2200	1246.98	1246.71	1246.53	1248.53	1243.10	1244.23	1249.05
47	0000	1246.88	1246.61	1246.42	1248.44	1243.01	1244.17	1248.95
47	0200	1246.85	1246.56	1246.37	1248.41	1243.00	1244.16	1248.90
47	0400	1246.81	1246.52	1246.33	1248.39	1242.99	1244.15	1248.87
47	0600	1246.78	1246.48	1246.29	1248.37	1242.97	1244.13	1248.84
47	0800	1246.74	1246.44	1246.25	1248.35	1242.93	1244.12	1248.81
47	1000	1246.71	1246.40	1246.22	1248.33	1242.88	1244.09	1248.78
47	1200	1246.74	1246.42	1246.24	1248.37	1242.91	1244.10	1248.81
47	1400	1246.80	1246.48	1246.31	1248.45	1242.94	1244.15	1248.90
47	1600	1246.84	1246.53	1246.36	1248.52	1242.98	1244.18	1248.97
47	1800	1246.86	1246.54	1246.38	1248.56	1243.01	1244.19	1249.02
47	2000	1246.86	1246.53	1246.38	1248.57	1242.97	1244.19	1249.03
47	2200	1246.86	1246.53	1246.39	1248.59	1242.98	1244.20	1249.06
48	0000	1246.87	1246.53	1246.40	1248.61	1242.97	1244.21	1249.08
48	0200	1246.86	1246.53	1246.40	1248.62	1242.96	1244.21	1249.09
48	0400	1246.86	1246.52	1246.40	1248.63	1242.95	1244.21	1249.09
48	0600	1246.85	1246.51	1246.38	1248.63	1242.94	1244.21	1249.10
48	0800	1246.78	1246.44	1246.33	1248.57	1242.85	1244.17	1249.05
48	1000	1246.72	1246.38	1246.27	1248.52	1242.82	1244.13	1248.99
48	1200	1246.69	1246.35	1246.24	1248.50	1242.78	1244.11	1248.96
48	1400	1246.70	1246.36	1246.26	1248.53	1242.80	1244.12	1248.97
48	1600	1246.68	1246.34	1246.25	1248.53	1242.80	1244.11	1248.97
48	1800	1246.65	1246.30	1246.21	1248.49	1242.79	1244.08	1248.94
48	2000	1246.60	1246.26	1246.16	1248.46	1242.72	1244.06	1248.90
48	2200	1246.59	1246.24	1246.14	1248.44	1242.72	1244.06	1248.88
49	0000	1246.60	1246.26	1246.16	1248.46	1242.73	1244.08	1248.88
49	0200	1246.61	1246.26	1246.17	1248.47	1242.75	1244.10	1248.89
49	0400	1246.67	1246.32	1246.22	1248.53	1242.78	1244.14	1248.94
49	0600	1246.67	1246.31	1246.22	1248.54	1242.76	1244.14	1248.96
49	0800	1246.72	1246.36	1246.28	1248.60	1242.76	1244.18	1249.01
49	1000	1246.74	1246.38	1246.30	1248.62	1242.74	1244.18	1249.04
49	1200	1246.79	1246.44	1246.37	1248.70	1242.84	1244.21	1249.11
49	1400	1246.87	1246.51	1246.45	1248.79	1242.87	1244.28	1249.21

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
49	1600	1246.90	1246.54	1246.48	1248.83	1242.85	1244.29	1249.27
49	1800	1246.85	1246.49	1246.44	1248.79	1242.80	1244.25	1249.24
49	2000	1246.80	1246.43	1246.39	1248.75	1242.75	1244.22	1249.20
49	2200	1246.73	1246.37	1246.33	1248.69	1242.70	1244.19	1249.13
50	0000	1246.72	1246.35	1246.31	1248.67	1242.65	1244.18	1249.11
50	0200	1246.66	1246.29	1246.25	1248.62	1242.62	1244.15	1249.05
50	0400	1246.62	1246.25	1246.21	1248.58	1242.58	1244.13	1249.00
50	0600	1246.59	1246.21	1246.17	1248.55	1242.55	1244.12	1248.95
50	0800	1246.55	1246.17	1246.13	1248.50	1242.45	1244.09	1248.90
50	1000	1246.49	1246.12	1246.07	1248.44	1242.45	1244.04	1248.84
50	1200	1246.48	1246.11	1246.06	1248.43	1242.43	1244.04	1248.82
50	1400	1246.51	1246.15	1246.11	1248.49	1242.47	1244.07	1248.85
50	1600	1246.53	1246.16	1246.12	1248.51	1242.48	1244.08	1248.89
50	1800	1246.79	1246.46	1246.45	1248.65	1243.91	1245.33	1248.90
50	2000	1246.94	1246.74	1246.77	1248.80	1242.02	1244.42	1248.94
50	2200	1247.05	1246.94	1247.01	1248.92	1241.81	1244.42	1249.00
51	0000	1247.12	1247.06	1247.15	1248.97	1241.75	1244.46	1249.03
51	0200	1247.20	1247.18	1247.28	1249.05	1241.79	1244.51	1249.08
51	0400	1247.27	1247.27	1247.38	1249.10	1241.81	1244.56	1249.12
51	0600	1247.29	1247.31	1247.42	1249.10	1241.78	1244.54	1249.12
51	0800	1247.30	1247.33	1247.44	1249.09	1241.75	1244.55	1249.09
51	1000	1247.26	1247.31	1247.41	1249.04	1241.72	1244.52	1249.04
51	1200	1247.31	1247.37	1247.46	1249.07	1241.76	1244.54	1249.04
51	1400	1247.35	1247.42	1247.51	1249.09	1241.72	1244.57	1249.06
51	1600	1247.37	1247.45	1247.53	1249.11	1241.79	1244.59	1249.08
51	1800	1247.37	1247.45	1247.53	1249.09	1241.76	1244.57	1249.06
51	2000	1247.35	1247.44	1247.52	1249.07	1241.71	1244.54	1249.03
51	2200	1247.40	1247.50	1247.57	1249.10	1241.78	1244.58	1249.05
52	0000	1247.40	1247.50	1247.56	1249.09	1241.75	1244.57	1249.04
52	0200	1247.44	1247.55	1247.61	1249.13	1241.81	1244.60	1249.07
52	0400	1247.48	1247.58	1247.64	1249.16	1241.82	1244.61	1249.09
52	0600	1247.50	1247.61	1247.67	1249.18	1241.83	1244.63	1249.11
52	0800	1247.48	1247.60	1247.66	1249.16	1241.78	1244.62	1249.10
52	1000	1247.50	1247.61	1247.67	1249.17	1241.79	1244.63	1249.10
52	1200	1247.51	1247.63	1247.68	1249.17	1241.84	1244.65	1249.10
52	1400	1247.55	1247.66	1247.72	1249.20	1241.85	1244.67	1249.13
52	1600	1247.55	1247.67	1247.72	1249.21	1241.85	1244.67	1249.14
52	1800	1247.53	1247.65	1247.70	1249.18	1241.87	1244.66	1249.12
52	2000	1247.54	1247.66	1247.71	1249.18	1241.86	1244.67	1249.11
52	2200	1247.54	1247.66	1247.70	1249.17	1241.84	1244.65	1249.09
53	0000	1247.57	1247.69	1247.73	1249.20	1241.87	1244.66	1249.11
53	0200	1247.58	1247.71	1247.75	1249.21	1241.87	1244.68	1249.13
53	0400	1247.61	1247.73	1247.78	1249.23	1241.92	1244.71	1249.15
53	0600	1247.61	1247.73	1247.78	1249.23	1241.91	1244.70	1249.15
53	0800	1247.61	1247.72	1247.77	1249.22	1241.85	1244.69	1249.14
53	1000	1247.60	1247.72	1247.75	1249.21	1241.89	1244.68	1249.12
53	1200	1248.27	1248.27	1248.34	1249.50	1246.33	1247.48	1249.24
53	1400	1248.78	1248.69	1248.76	1249.81	1247.19	1248.13	1249.45
53	1600	1249.04	1248.94	1249.04	1250.05	1247.59	1248.39	1249.65
53	1800	1248.48	1248.16	1248.07	1249.64	1244.04	1245.30	1249.64
53	2000	1248.09	1247.66	1247.50	1249.34	1243.43	1244.81	1249.51

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
53	2200	1247.89	1247.38	1247.18	1249.13	1243.20	1244.57	1249.39
54	0000	1247.77	1247.20	1246.97	1249.00	1243.07	1244.43	1249.29
54	0200	1247.69	1247.06	1246.82	1248.90	1242.96	1244.34	1249.20
54	0400	1247.60	1246.95	1246.69	1248.81	1242.89	1244.25	1249.13
54	0600	1247.52	1246.84	1246.58	1248.72	1242.81	1244.18	1249.04
54	0800	1247.37	1246.66	1246.38	1248.56	1242.66	1244.06	1248.89
54	1000	1247.22	1246.50	1246.22	1248.41	1242.54	1243.94	1248.73
54	1200	1247.13	1246.39	1246.10	1248.31	1242.38	1243.84	1248.62
54	1400	1247.08	1246.33	1246.03	1248.27	1242.38	1243.79	1248.56
54	1600	1247.04	1246.28	1245.98	1248.24	1242.35	1243.77	1248.52
54	1800	1246.96	1246.19	1245.88	1248.17	1242.30	1243.70	1248.45
54	2000	1246.91	1246.14	1245.82	1248.12	1242.24	1243.66	1248.40
54	2200	1246.88	1246.10	1245.78	1248.09	1242.23	1243.63	1248.37
55	0000	1246.86	1246.08	1245.77	1248.09	1242.20	1243.62	1248.35
55	0200	1246.87	1246.08	1245.76	1248.10	1242.20	1243.63	1248.35
55	0400	1246.86	1246.07	1245.76	1248.11	1242.19	1243.63	1248.36
55	0600	1246.86	1246.06	1245.74	1248.11	1242.18	1243.62	1248.36
55	0800	1246.81	1246.02	1245.69	1248.07	1242.13	1243.59	1248.32
55	1000	1246.80	1246.00	1245.68	1248.06	1242.13	1243.59	1248.30
55	1200	1246.82	1246.02	1245.69	1248.08	1242.04	1243.61	1248.32
55	1400	1246.90	1246.10	1245.78	1248.18	1242.20	1243.68	1248.40
55	1600	1246.93	1246.13	1245.81	1248.22	1242.19	1243.71	1248.45
55	1800	1246.95	1246.14	1245.83	1248.25	1242.20	1243.71	1248.48
55	2000	1246.94	1246.13	1245.82	1248.24	1242.17	1243.70	1248.48
55	2200	1246.94	1246.13	1245.82	1248.24	1242.16	1243.71	1248.48
56	0000	1246.96	1246.14	1245.83	1248.26	1242.15	1243.72	1248.50
56	0200	1246.97	1246.16	1245.85	1248.28	1242.15	1243.73	1248.51
56	0400	1246.98	1246.16	1245.85	1248.29	1242.14	1243.74	1248.52
56	0600	1246.95	1246.13	1245.82	1248.26	1242.11	1243.73	1248.50
56	0800	1246.93	1246.11	1245.80	1248.24	1242.08	1243.68	1248.48
56	1000	1246.92	1246.10	1245.79	1248.23	1242.03	1243.67	1248.47
56	1200	1246.95	1246.13	1245.82	1248.27	1242.09	1243.70	1248.49
56	1400	1246.99	1246.16	1245.86	1248.31	1242.14	1243.75	1248.52
56	1600	1247.00	1246.17	1245.86	1248.32	1242.10	1243.74	1248.54
56	1800	1246.97	1246.14	1245.84	1248.30	1242.03	1243.73	1248.53
56	2000	1246.96	1246.13	1245.82	1248.29	1242.00	1243.71	1248.51
56	2200	1246.94	1246.10	1245.80	1248.26	1241.98	1243.68	1248.48
57	0000	1246.95	1246.11	1245.81	1248.27	1241.96	1243.68	1248.48
57	0200	1246.97	1246.12	1245.81	1248.28	1241.96	1243.69	1248.50
57	0400	1246.97	1246.12	1245.81	1248.29	1241.94	1243.68	1248.50
57	0600	1246.94	1246.10	1245.79	1248.27	1241.92	1243.67	1248.47
57	0800	1246.92	1246.07	1245.76	1248.23	1241.88	1243.66	1248.44
57	1000	1246.91	1246.06	1245.75	1248.22	1241.83	1243.65	1248.42
57	1200	1246.93	1246.08	1245.77	1248.25	1241.96	1243.67	1248.43
57	1400	1247.02	1246.18	1245.87	1248.34	1241.96	1243.75	1248.52
57	1600	1247.06	1246.20	1245.90	1248.37	1241.96	1243.77	1248.56
57	1800	1247.04	1246.18	1245.89	1248.36	1241.97	1243.75	1248.56
57	2000	1247.01	1246.16	1245.86	1248.33	1241.90	1243.72	1248.53
57	2200	1246.98	1246.13	1245.82	1248.31	1241.94	1243.71	1248.50
58	0000	1246.92	1246.07	1245.77	1248.25	1241.98	1243.66	1248.46
58	0200	1246.85	1245.99	1245.69	1248.16	1241.90	1243.61	1248.37

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
58	0400	1246.83	1245.98	1245.66	1248.13	1241.91	1243.59	1248.32
58	0600	1246.81	1245.95	1245.64	1248.12	1241.95	1243.58	1248.28
58	0800	1246.74	1245.89	1245.57	1248.04	1241.91	1243.55	1248.22
58	1000	1246.71	1245.86	1245.54	1248.01	1241.95	1243.53	1248.16
58	1200	1246.71	1245.87	1245.54	1248.01	1242.00	1243.54	
58	1400	1246.75	1245.90	1245.57	1248.04	1242.01	1243.57	1248.17
58	1600	1246.75	1245.90	1245.57	1248.05	1242.07	1243.59	1248.18
58	1800	1246.70	1245.86	1245.53	1248.01	1242.02	1243.55	1248.14
58	2000	1246.64	1245.81	1245.47	1247.95	1241.98	1243.50	1248.08
58	2200	1246.60	1245.78	1245.43	1247.91	1241.99	1243.47	1248.04
59	0000	1246.59	1245.76	1245.41	1247.89	1241.99	1243.47	1248.01
59	0200	1246.58	1245.76	1245.40	1247.88	1242.00	1243.47	1248.00
59	0400	1246.55	1245.73	1245.37	1247.87	1242.01	1243.46	1247.97
59	0600	1246.49	1245.68	1245.32	1247.80	1242.00	1243.42	1247.91
59	0800	1246.47	1245.65	1245.28	1247.77	1241.95	1243.39	1247.87
59	1000	1246.44	1245.63	1245.26	1247.74	1241.96	1243.38	1247.83
59	1200	1246.45	1245.64	1245.27	1247.77	1242.03	1243.41	1247.83
59	1400	1246.55	1245.74	1245.37	1247.86	1242.09	1243.47	1247.91
59	1600	1246.59	1245.77	1245.41	1247.91	1242.20	1243.50	1247.97
59	1800	1246.58	1245.76	1245.40	1247.90	1242.14	1243.49	1247.99
59	2000	1246.55	1245.73	1245.37	1247.87	1242.09	1243.46	1247.95
59	2200	1246.53	1245.71	1245.34	1247.84	1242.08	1243.44	1247.91
60	0000	1246.53	1245.71	1245.34	1247.83	1242.09	1243.42	1247.90
60	0200	1246.55	1245.73	1245.36	1247.85	1242.11	1243.43	1247.91
60	0400	1246.59	1245.77	1245.40	1247.89	1242.15	1243.46	1247.95
60	0600	1246.60	1245.77	1245.40	1247.89	1242.15	1243.46	1247.95
60	0800	1246.59	1245.76	1245.39	1247.88	1242.14	1243.45	1247.94
60	1000	1246.61	1245.79	1245.41	1247.89	1242.17	1243.46	1247.95
60	1200	1246.70	1245.86	1245.50	1247.99	1242.23	1243.53	1248.03
60	1400	1245.77	1245.19	1245.45	1248.09	1243.03	1244.10	1248.12
60	1600	1245.36	1244.86	1245.33	1248.21	1243.79	1244.55	1248.22
60	1800	1245.30	1244.78	1245.33	1248.28	1243.99	1244.63	1248.30
60	2000	1245.26	1244.73	1245.32	1248.31	1244.08	1244.66	1248.34
60	2200	1245.24	1244.69	1245.31	1248.31	1244.13	1244.69	1248.36
61	0000	1245.25	1244.70	1245.35	1248.36	1244.20	1244.73	1248.40
61	0200	1245.26	1244.70	1245.37	1248.41	1244.24	1244.76	1248.46
61	0400	1245.27	1244.71	1245.40	1248.44	1244.30	1244.79	1248.50
61	0600	1245.28	1244.71	1245.41	1248.47	1244.33	1244.81	1248.54
61	0800	1245.25	1244.67	1245.39	1248.46	1244.27	1244.81	1248.53
61	1000	1245.21	1244.63	1245.35	1248.42	1244.30	1244.79	1248.50
61	1200	1245.23	1244.64	1245.37	1248.45	1244.34	1244.81	1248.53
61	1400	1245.25	1244.65	1245.39	1248.50	1244.31	1244.82	1248.57
61	1600	1245.24	1244.64	1245.40	1248.52	1244.34	1244.82	1248.61
61	1800	1245.17	1244.57	1245.35	1248.51	1244.25	1244.76	1248.61
61	2000	1245.09	1244.48	1245.29	1248.46	1244.16	1244.69	1248.58
61	2200	1245.05	1244.43	1245.25	1248.43	1244.15	1244.67	1248.56
62	0000	1245.04	1244.41	1245.23	1248.42	1244.15	1244.67	1248.54
62	0200	1245.02	1244.38	1245.21	1248.39	1244.13	1244.66	1248.52
62	0400	1245.00	1244.36	1245.18	1248.38	1244.13	1244.65	1248.50
62	0600	1244.97	1244.32	1245.15	1248.35	1244.10	1244.62	1248.47
62	0800	1244.93	1244.28	1245.11	1248.31	1244.04	1244.60	1248.43

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
62	1000	1244.90	1244.25	1245.08	1248.28	1244.06	1244.58	1248.40
62	1200	1244.89	1244.24	1245.08	1248.29	1244.04	1244.58	1248.40
62	1400	1244.90	1244.24	1245.09	1248.31	1244.08	1244.59	1248.42
62	1600	1244.88	1244.22	1245.08	1248.31	1244.07	1244.58	1248.42
62	1800	1244.85	1244.19	1245.05	1248.27	1244.06	1244.57	1248.40
62	2000	1244.77	1244.11	1244.96	1248.19	1243.96	1244.50	1248.33
62	2200	1244.76	1244.10	1244.95	1248.17	1243.96	1244.50	1248.30
63	0000	1244.79	1244.11	1244.96	1248.19	1243.99	1244.52	1248.30
63	0200	1244.80	1244.12	1244.97	1248.20	1244.00	1244.53	1248.30
63	0400	1244.81	1244.13	1244.99	1248.22	1244.03	1244.55	1248.33
63	0600	1244.80	1244.12	1244.98	1248.22	1244.03	1244.55	1248.33
63	0800	1244.80	1244.12	1244.97	1248.21	1244.01	1244.54	1248.32
63	1000	1244.78	1244.09	1244.96	1248.20	1243.96	1244.54	1248.30
63	1200	1244.78	1244.10	1244.97	1248.22	1244.00	1244.54	1248.32
63	1400	1244.80	1244.11	1245.00	1248.26	1244.03	1244.55	1248.36
63	1600	1244.78	1244.10	1245.00	1248.26	1243.97	1244.54	1248.37
63	1800	1244.75	1244.06	1244.96	1248.22	1244.01	1244.52	1248.34
63	2000	1245.04	1244.39	1245.07	1248.22	1244.44	1244.73	1248.32
63	2200	1247.10	1246.32	1246.38	1248.65	1246.66	1246.84	1248.43
64	0000	1247.77	1247.03	1247.09	1249.01	1247.20	1247.42	1248.63
64	0200	1248.10	1247.44	1247.53	1249.28	1247.52	1247.73	1248.81
64	0400	1248.33	1247.72	1247.84	1249.47	1247.75	1247.97	1248.98
64	0600	1248.47	1247.92	1248.04	1249.60	1247.90	1248.12	1249.07
64	0800	1248.59	1248.08	1248.21	1249.70	1248.00	1248.26	1249.17
64	1000	1248.71	1248.22	1248.36	1249.79	1248.17	1248.38	1249.24
64	1200	1248.85	1248.38	1248.53	1249.92	1248.28	1248.52	1249.36
64	1400	1249.01	1248.56	1248.72	1250.09	1248.53	1248.69	1249.52
64	1600	1249.13	1248.69	1248.88	1250.21	1248.57	1248.81	1249.65
64	1800	1249.20	1248.78	1248.97	1250.26	1248.70	1248.90	1249.73
64	2000	1249.26	1248.85	1249.04	1250.30	1248.76	1248.97	1249.76
64	2200	1249.35	1248.94	1249.13	1250.37	1248.86	1249.05	1249.82
65	0000	1249.41	1249.02	1249.20	1250.41	1248.93	1249.13	1249.87
65	0200	1249.51	1249.13	1249.31	1250.48	1249.03	1249.22	1249.94
65	0400	1249.56	1249.19	1249.36	1250.54	1249.09	1249.29	1249.99
65	0600	1249.58	1249.21	1249.39	1250.52	1249.11	1249.31	1249.99
65	0800	1249.57	1249.22	1249.38	1250.49	1249.13	1249.31	1249.95
65	1000	1249.61	1249.26	1249.41	1250.49	1249.16	1249.36	1249.94
65	1200	1249.19	1248.90	1248.79	1250.12	1246.08	1246.32	1249.87
65	1400	1248.45	1248.23	1248.34	1249.85	1245.42	1246.12	1249.48
65	1600	1248.64	1248.06	1248.03	1249.61	1245.32	1246.05	1248.95
65	1800	1248.58	1247.90	1247.82	1249.44	1245.27	1245.95	1248.67
65	2000	1248.51	1247.78	1247.66	1249.30	1245.15	1245.87	1248.48
65	2200	1248.44	1247.68	1247.54	1249.20	1245.09	1245.81	1248.34
66	0000	1248.36	1247.58	1247.43	1249.09	1245.04	1245.76	1248.21
66	0200	1248.30	1247.50	1247.33	1249.00	1244.98	1245.71	1248.12
66	0400	1248.22	1247.42	1247.24	1248.91	1244.93	1245.66	1248.01
66	0600	1248.15	1247.35	1247.15	1248.82	1244.89	1245.62	1247.91
66	0800	1248.04	1247.23	1247.02	1248.69	1244.82	1245.56	1247.79
66	1000	1247.95	1247.14	1246.93	1248.58	1244.80	1245.50	1247.67
66	1200	1247.92	1247.11	1246.90	1248.55	1244.78	1245.49	1247.62
66	1400	1247.91	1247.10	1246.87	1248.53	1244.82	1245.50	1247.60

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
66	1600	1247.86	1247.05	1246.82	1248.48	1244.75	1245.46	1247.54
66	1800	1247.81	1246.99	1246.76	1248.42	1244.71	1245.42	1247.49
66	2000	1247.77	1246.96	1246.72	1248.37	1244.70	1245.40	1247.43
66	2200	1247.73	1246.93	1246.67	1248.33	1244.69	1245.38	1247.39
67	0000	1247.70	1246.90	1246.64	1248.30	1244.69	1245.38	1247.36
67	0200	1247.69	1246.89	1246.63	1248.29	1244.69	1245.38	1247.33
67	0400	1247.67	1246.87	1246.62	1248.27	1244.70	1245.37	1247.31
67	0600	1247.63	1246.84	1246.58	1248.23	1244.69	1245.36	1247.28
67	0800	1247.58	1246.80	1246.53	1248.18	1244.63	1245.33	1247.23
67	1000	1247.57	1246.79	1246.51	1248.16	1244.63	1245.33	1247.20
67	1200	1247.61	1246.82	1246.55	1248.21	1244.69	1245.36	1247.22
67	1400	1247.64	1246.86	1246.60	1248.25	1244.68	1245.39	1247.26
67	1600	1247.67	1246.89	1246.63	1248.29	1244.68	1245.40	1247.31
67	1800	1247.64	1246.86	1246.61	1248.27	1244.68	1245.39	1247.29
67	2000	1247.61	1246.83	1246.57	1248.24	1244.65	1245.37	1247.26
67	2200	1247.58	1246.81	1246.54	1248.21	1244.65	1245.36	1247.23
68	0000	1247.60	1246.82	1246.55	1248.22	1244.67	1245.38	1247.23
68	0200	1247.57	1246.80	1246.52	1248.19	1244.65	1245.36	1247.21
68	0400	1247.56	1246.79	1246.52	1248.18	1244.66	1245.36	1247.19
68	0600	1247.55	1246.78	1246.50	1248.16	1244.66	1245.35	1247.17
68	0800	1247.52	1246.75	1246.47	1248.13	1244.64	1245.34	1247.14
68	1000	1247.52	1246.75	1246.46	1248.12	1244.62	1245.35	1247.12
68	1200	1247.56	1246.80	1246.51	1248.17	1244.75	1245.38	1247.16
68	1400	1247.64	1246.86	1246.59	1248.23	1244.79	1245.43	1247.24
68	1600	1247.68	1246.90	1246.63	1248.31	1244.75	1245.45	1247.29
68	1800	1247.68	1246.90	1246.64	1248.31	1244.79	1245.44	1247.31
68	2000	1247.68	1246.90	1246.63	1248.31	1244.77	1245.44	1247.31
68	2200	1247.67	1246.89	1246.62	1248.30	1244.78	1245.44	1247.29
69	0000	1247.67	1246.90	1246.63	1248.30	1244.78	1245.45	1247.29
69	0200	1247.68	1246.90	1246.64	1248.31	1244.81	1245.46	1247.30
69	0400	1247.69	1246.91	1246.64	1248.31	1244.82	1245.47	1247.31
69	0600	1247.67	1246.89	1246.62	1248.29	1244.80	1245.46	1247.28
69	0800	1247.64	1246.86	1246.60	1248.26	1244.76	1245.45	1247.26
69	1000	1247.64	1246.86	1246.59	1248.25	1244.77	1245.44	1247.25
69	1200	1247.68	1246.89	1246.62	1248.29	1244.81	1245.46	1247.27
69	1400	1247.73	1246.94	1246.68	1248.35	1244.84	1245.49	1247.33
69	1600	1247.76	1246.98	1246.71	1248.39	1244.84	1245.50	1247.36
69	1800	1247.76	1246.97	1246.71	1248.39	1244.85	1245.49	1247.37
69	2000	1247.77	1246.97	1246.71	1248.39	1244.84	1245.50	1247.38
69	2200	1247.76	1246.96	1246.70	1248.38	1244.83	1245.49	1247.37
70	0000	1247.77	1246.97	1246.72	1248.39	1244.83	1245.49	1247.38
70	0200	1247.78	1246.97	1246.72	1248.39	1244.84	1245.49	1247.38
70	0400	1247.78	1246.98	1246.73	1248.40	1244.85	1245.50	1247.39
70	0600	1247.77	1246.96	1246.71	1248.38	1244.83	1245.49	1247.37
70	0800	1247.75	1246.95	1246.70	1248.37	1244.81	1245.48	1247.36
70	1000	1247.74	1246.94	1246.68	1248.35	1244.80	1245.48	1247.34
70	1200	1247.75	1246.94	1246.69	1248.36	1244.82	1245.48	1247.34
70	1400	1247.80	1246.98	1246.74	1248.41	1244.82	1245.50	1247.37
70	1600	1247.81	1247.00	1246.75	1248.43	1244.82	1245.49	1247.39
70	1800	1247.78	1246.96	1246.71	1248.40	1244.79	1245.45	1247.38
70	2000	1247.75	1246.93	1246.68	1248.37	1244.75	1245.42	1247.34

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
70	2200	1247.74	1246.92	1246.68	1248.36	1244.76	1245.43	1247.33
71	0000	1247.76	1246.93	1246.68	1248.37	1244.77	1245.44	1247.34
71	0200	1247.76	1246.94	1246.69	1248.38	1244.78	1245.45	1247.34
71	0400	1247.76	1246.95	1246.70	1248.39	1244.79	1245.45	1247.35
71	0600	1247.76	1246.94	1246.69	1248.38	1244.79	1245.44	1247.34
71	0800	1247.75	1246.94	1246.68	1248.36	1244.76	1245.44	1247.34
71	1000	1247.80	1246.99	1246.75	1248.39	1245.67	1245.85	
79	1800	1249.78	1249.52	1249.45	1250.34	1249.20	1249.40	1249.60
79	2000	1249.81	1249.55	1249.49	1250.37	1249.25	1249.44	1249.63
79	2200	1249.84	1249.59	1249.52	1250.39	1249.27	1249.47	1249.64
80	0000	1249.88	1249.63	1249.56	1250.42	1249.33	1249.51	1249.68
80	0200	1249.90	1249.65	1249.58	1250.43	1249.36	1249.54	1249.70
80	0400	1249.93	1249.69	1249.62	1250.46	1249.40	1249.58	1249.73
80	0600	1249.94	1249.69	1249.63	1250.46	1249.41	1249.59	1249.73
80	0800	1249.94	1249.70	1249.64	1250.46	1249.43	1249.60	1249.73
80	1000	1249.97	1249.73	1249.66	1250.47	1249.42	1249.62	1249.74
80	1200	1250.02	1249.78	1249.71	1250.50	1249.53	1249.67	1249.78
80	1400	1250.10	1249.87	1249.80	1250.60	1249.56	1249.75	1249.87
80	1600	1250.15	1249.92	1249.86	1250.65	1249.65	1249.80	1249.94
80	1800	1250.19	1249.95	1249.90	1250.69	1249.71	1249.84	1249.99
80	2000	1250.20	1249.97	1249.93	1250.71	1249.71	1249.86	1250.01
80	2200	1250.23	1250.00	1249.96	1250.73	1249.73	1249.88	1250.03
81	0000	1250.26	1250.03	1249.98	1250.75	1249.76	1249.91	1250.06
81	0200	1250.29	1250.06	1250.02	1250.78	1249.81	1249.94	1250.10
81	0400	1250.31	1250.08	1250.05	1250.80	1249.82	1249.96	1250.12
81	0600	1250.33	1250.10	1250.07	1250.81	1249.85	1249.99	1250.14
81	0800	1250.34	1250.11	1250.08	1250.82	1249.83	1249.99	1250.15
81	1000	1250.37	1250.14	1250.11	1250.83	1249.88	1250.02	1250.17
81	1200	1250.41	1250.18	1250.15	1250.87	1249.91	1250.06	1250.21
81	1400	1250.49	1250.26	1250.23	1250.95	1249.99	1250.13	1250.29
81	1600	1250.53	1250.30	1250.29	1250.99	1250.05	1250.18	1250.36
81	1800	1250.54	1250.31	1250.31	1251.01	1250.08	1250.19	1250.38
81	2000	1250.53	1250.30	1250.29	1250.99	1250.06	1250.18	1250.37
81	2200	1250.52	1250.29	1250.29	1250.98	1250.07	1250.17	1250.36
82	0000	1250.52	1250.30	1250.28	1250.97	1250.07	1250.18	1250.36
82	0200	1250.51	1250.28	1250.26	1250.94	1250.06	1250.16	1250.33
82	0400	1250.54	1250.32	1250.30	1250.97	1250.10	1250.20	1250.35
82	0600	1250.54	1250.31	1250.29	1250.95	1250.09	1250.19	1250.35
82	0800	1250.55	1250.33	1250.31	1250.97	1250.11	1250.21	1250.36
82	1000	1250.56	1250.33	1250.31	1250.96	1250.10	1250.21	1250.36
82	1200	1250.62	1250.40	1250.37	1251.02	1250.14	1250.26	1250.42
82	1400	1250.68	1250.46	1250.44	1251.08	1250.19	1250.33	1250.50
82	1600	1250.72	1250.50	1250.49	1251.13	1250.27	1250.35	1250.55
82	1800	1250.76	1250.54	1250.53	1251.17	1250.34	1250.39	1250.60
82	2000	1250.75	1250.53	1250.53	1251.16	1250.30	1250.39	1250.61
82	2200	1250.77	1250.55	1250.55	1251.17	1250.30	1250.40	1250.62
83	0000	1250.79	1250.57	1250.57	1251.20	1250.34	1250.42	1250.65
83	0200	1250.82	1250.59	1250.60	1251.21	1250.36	1250.45	1250.67
83	0400	1250.83	1250.60	1250.61	1251.22	1250.37	1250.46	1250.69
83	0600	1250.81	1250.59	1250.60	1251.20	1250.36	1250.45	1250.67

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
83	0800	1250.80	1250.57	1250.58	1251.18	1250.34	1250.43	1250.65
83	1000	1250.80	1250.58	1250.58	1251.17	1250.29	1250.44	1250.64
83	1200	1250.85	1250.62	1250.63	1251.21	1250.31	1250.47	1250.69
83	1400	1250.89	1250.67	1250.68	1251.26	1250.43	1250.52	1250.74
83	1600	1250.93	1250.71	1250.72	1251.30	1250.49	1250.56	1250.79
83	1800	1250.93	1250.70	1250.72	1251.30	1250.48	1250.56	1250.80
83	2000	1250.88	1250.66	1250.67	1251.24	1250.43	1250.52	1250.75
83	2200	1250.92	1250.71	1250.72	1251.29	1250.48	1250.55	1250.79
84	0000	1250.92	1250.70	1250.71	1251.27	1250.48	1250.54	1250.78
84	0200	1250.92	1250.71	1250.72	1251.27	1250.48	1250.55	1250.79
84	0400	1250.93	1250.71	1250.72	1251.27	1250.49	1250.56	1250.78
84	0600	1250.94	1250.72	1250.73	1251.28	1250.50	1250.57	1250.80
84	0800	1250.98	1250.76	1250.77	1251.32	1250.53	1250.61	1250.84
84	1000	1250.97	1250.75	1250.77	1251.30	1250.53	1250.61	1250.84
84	1200	1250.99	1250.76	1250.78	1251.32	1250.65	1250.62	1250.84
84	1400	1251.03	1250.82	1250.84	1251.37	1250.58	1250.66	1250.91
84	1600	1250.89	1250.67	1250.68	1251.21	1250.51	1250.54	1250.77
84	1800	1250.79	1250.57	1250.56	1251.09	1250.40	1250.46	1250.63
84	2000	1250.70	1250.49	1250.46	1250.98	1250.32	1250.38	1250.51
84	2200	1250.69	1250.47	1250.43	1250.94	1250.32	1250.36	1250.46
85	0000	1250.65	1250.45	1250.38	1250.90	1250.30	1250.33	1250.40
85	0200	1250.67	1250.47	1250.40	1250.91	1250.33	1250.36	1250.41
85	0400	1250.65	1250.45	1250.38	1250.88	1250.32	1250.34	1250.37
85	0600	1250.60	1250.41	1250.33	1250.82	1250.29	1250.30	1250.32
85	0800	1250.56	1250.37	1250.28	1250.78	1250.22	1250.27	1250.27
85	1000	1250.58	1250.39	1250.29	1250.78	1250.23	1250.28	1250.27
85	1200	1250.64	1250.44	1250.34	1250.82	1250.31	1250.33	1250.31
85	1400	1250.69	1250.51	1250.40	1250.88	1250.40	1250.39	1250.37
85	1600	1250.51	1250.34	1250.17	1250.80	1249.74	1249.03	1250.37
85	1800	1250.62	1250.44	1250.33	1250.84	1250.21	1250.19	1250.38
85	2000	1250.66	1250.47	1250.36	1250.85	1250.26	1250.29	1250.37
85	2200	1250.62	1250.43	1250.33	1250.80	1250.24	1250.28	1250.31
86	0000	1250.64	1250.46	1250.34	1250.80	1250.30	1250.31	1250.31
86	0200	1250.62	1250.45	1250.32	1250.78	1250.28	1250.30	1250.28
86	0400	1250.68	1250.50	1250.38	1250.83	1250.36	1250.36	1250.33
86	0600	1250.72	1250.55	1250.43	1250.87	1250.39	1250.40	1250.38
86	0800	1250.74	1250.57	1250.46	1250.90	1250.39	1250.43	1250.41
86	1000	1250.76	1250.58	1250.47	1250.90	1250.40	1250.43	1250.42
86	1200	1250.82	1250.65	1250.54	1250.96	1250.44	1250.49	1250.49
86	1400	1250.88	1250.72	1250.61	1251.03	1250.54	1250.55	1250.57
86	1600	1250.90	1250.73	1250.65	1251.06	1250.53	1250.58	1250.61
86	1800	1250.88	1250.70	1250.61	1251.03	1250.53	1250.55	1250.59
86	2000	1250.88	1250.70	1250.61	1251.02	1250.52	1250.55	1250.58
86	2200	1250.88	1250.70	1250.61	1251.01	1250.53	1250.55	1250.58
87	0000	1250.91	1250.74	1250.65	1251.05	1250.56	1250.58	1250.62
87	0200	1250.94	1250.76	1250.68	1251.08	1250.57	1250.60	1250.65
87	0400	1250.94	1250.77	1250.69	1251.08	1250.61	1250.61	1250.65
87	0600	1250.95	1250.77	1250.70	1251.09	1250.58	1250.62	1250.67
87	0800	1250.96	1250.78	1250.71	1251.09	1250.55	1250.62	1250.68
87	1000	1250.37	1250.20	1250.13	1250.89	1249.49	1247.82	1250.63
87	1200	1249.85	1249.72	1249.67	1250.64	1248.65	1247.01	1250.51

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
87	1400	1249.59	1249.45	1249.42	1250.46	1248.27	1246.70	1250.39
87	1600	1249.47	1249.30	1249.29	1250.38	1248.04	1246.53	1250.32
87	1800	1249.34	1249.17	1249.15	1250.26	1247.89	1246.39	1250.23
87	2000	1249.25	1249.06	1249.04	1250.18	1247.76	1246.28	1250.15
87	2200	1249.16	1248.97	1248.94	1250.09	1247.63	1246.19	1250.06
88	0000	1249.11	1248.92	1248.89	1250.04	1247.55	1246.14	1250.01
88	0200	1249.10	1248.90	1248.87	1250.04	1247.51	1246.12	1250.00
88	0400	1249.06	1248.87	1248.85	1250.01	1247.46	1246.09	1249.97
88	0600	1249.00	1248.80	1248.78	1249.95	1247.39	1246.04	1249.92
88	0800	1248.93	1248.74	1248.71	1249.88	1247.31	1245.99	1249.85
88	1000	1248.90	1248.71	1248.68	1249.85	1247.25	1245.96	1249.80
88	1200	1248.89	1248.70	1248.67	1249.85	1247.28	1245.96	1249.80
88	1400	1248.90	1248.72	1248.68	1249.87	1247.20	1245.97	1249.82
88	1600	1248.91	1248.73	1248.69	1249.88	1247.29	1245.98	1249.83
88	1800	1248.89	1248.70	1248.68	1249.87	1247.26	1245.96	1249.82
88	2000	1248.85	1248.66	1248.64	1249.84	1247.18	1245.93	1249.79
88	2200	1248.81	1248.61	1248.59	1249.79	1247.13	1245.89	1249.75
89	0000	1248.81	1248.62	1248.60	1249.80	1247.12	1245.91	1249.75
89	0200	1248.81	1248.62	1248.59	1249.79	1247.11	1245.91	1249.75
89	0400	1248.81	1248.62	1248.61	1249.81	1247.11	1245.92	1249.76
89	0600	1248.78	1248.60	1248.58	1249.79	1247.10	1245.90	1249.73
89	0800	1248.75	1248.56	1248.55	1249.76	1247.03	1245.88	1249.71
89	1000	1248.75	1248.56	1248.54	1249.76	1246.93	1245.88	1249.71
89	1200	1248.79	1248.60	1248.59	1249.81	1247.04	1245.91	1249.74
89	1400	1248.83	1248.64	1248.64	1249.86	1247.20	1245.95	1249.80
89	1600	1248.83	1248.65	1248.65	1249.87	1247.13	1245.95	1249.83
89	1800	1248.82	1248.63	1248.64	1249.86	1247.11	1245.95	1249.82
89	2000	1248.81	1248.61	1248.62	1249.85	1247.09	1245.93	1249.81
89	2200	1248.77	1248.58	1248.59	1249.82	1247.05	1245.91	1249.77
90	0000	1248.78	1248.60	1248.60	1249.83	1247.04	1245.92	1249.79
90	0200	1248.77	1248.59	1248.60	1249.83	1247.01	1245.92	1249.78
90	0400	1248.77	1248.58	1248.59	1249.82	1247.02	1245.92	1249.78
90	0600	1248.78	1248.59	1248.60	1249.84	1247.05	1245.93	1249.79
90	0800	1248.75	1248.56	1248.57	1249.81	1247.00	1245.92	1249.77
90	1000	1248.75	1248.56	1248.57	1249.82	1247.03	1245.92	1249.77
90	1200	1248.74	1248.55	1248.57	1249.80	1247.00	1245.92	1249.76
90	1400	1248.70	1248.51	1248.53	1249.77	1246.97	1245.89	1249.73
90	1600	1248.62	1248.43	1248.42	1249.68	1246.92	1245.83	1249.64
90	1800	1248.51	1248.32	1248.32	1249.55	1246.84	1245.76	1249.50
90	2000	1248.44	1248.25	1248.23	1249.47	1246.78	1245.71	1249.41
90	2200	1248.42	1248.23	1248.20	1249.44	1246.77	1245.69	1249.36
91	0000	1248.41	1248.22	1248.19	1249.43	1246.76	1245.68	1249.34
91	0200	1248.42	1248.24	1248.20	1249.43	1246.77	1245.70	1249.34
91	0400	1248.41	1248.23	1248.19	1249.43	1246.77	1245.71	1249.33
91	0600	1248.40	1248.23	1248.19	1249.42	1246.75	1245.70	1249.33
91	0800	1248.36	1248.19	1248.15	1249.39	1246.69	1245.68	1249.28
91	1000	1248.36	1248.18	1248.13	1249.35	1246.74	1245.72	1249.24
91	1200	1248.39	1248.22	1248.16	1249.38	1246.79	1245.78	1249.25
91	1400	1248.43	1248.26	1248.20	1249.42	1246.82	1245.79	1249.29
91	1600	1248.45	1248.28	1248.23	1249.44	1246.85	1245.80	1249.33
91	1800	1248.46	1248.28	1248.24	1249.44	1246.87	1245.83	1249.33

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
91	2000	1248.41	1248.23	1248.18	1249.40	1246.79	1245.77	1249.28
91	2200	1248.38	1248.20	1248.15	1249.36	1246.76	1245.75	1249.25
92	0000	1248.38	1248.21	1248.15	1249.36	1246.78	1245.80	1249.24
92	0200	1248.39	1248.21	1248.16	1249.36	1246.78	1245.79	1249.24
92	0400	1248.40	1248.22	1248.17	1249.38	1246.78	1245.78	1249.25
92	0600	1248.38	1248.20	1248.15	1249.36	1246.75	1245.76	1249.23
92	0800	1248.35	1248.17	1248.11	1249.32	1246.69	1245.74	1249.20
92	1000	1248.43	1248.26	1248.18	1249.35	1245.94	1246.12	1249.20
92	1200	1248.54	1248.37	1248.29	1249.42	1245.78	1246.33	1249.26
92	1400	1248.61	1248.46	1248.37	1249.49	1245.74	1246.41	1249.33
92	1600	1248.66	1248.53	1248.45	1249.24	1245.81	1246.47	1249.38
92	1800	1248.69	1248.55	1248.47	1249.55	1245.75	1246.46	1249.40
92	2000	1248.69	1248.55	1248.49	1249.60	1245.71	1246.45	1249.42
92	2200	1248.68	1248.55	1248.49	1249.60	1245.69	1246.45	1249.43
93	0000	1248.71	1248.59	1248.52	1249.64	1245.70	1246.47	1249.46
93	0200	1248.70	1248.58	1248.52	1249.63	1245.69	1246.47	1249.47
93	0400	1248.72	1248.60	1248.54	1249.65	1245.70	1246.49	1249.49
93	0600	1248.70	1248.58	1248.54	1249.64	1245.68	1246.49	1249.49
93	0800	1248.69	1248.57	1248.52	1249.62	1245.65	1246.47	1249.47
93	1000	1248.71	1248.58	1248.53	1249.63	1245.65	1246.49	1249.47
93	1200	1248.75	1248.62	1248.58	1249.68	1245.67	1246.52	1249.52
93	1400	1248.79	1248.66	1248.63	1249.73	1245.71	1246.56	1249.57
93	1600	1248.82	1248.69	1248.66	1249.77	1245.74	1246.58	1249.62
93	1800	1248.82	1248.69	1248.66	1249.78	1245.74	1246.58	1249.64
93	2000	1248.80	1248.68	1248.66	1249.77	1245.71	1246.56	1249.62
93	2200	1248.76	1248.63	1248.62	1249.73	1245.68	1246.53	1249.59
94	0000	1248.76	1248.63	1248.61	1249.71	1245.68	1246.53	1249.58
94	0200	1248.89	1248.81	1248.77	1249.77	1246.62	1247.36	1249.60
94	0400	1249.44	1249.28	1249.24	1250.01	1247.89	1248.67	1249.71
94	0600	1249.73	1249.55	1249.52	1250.19	1248.35	1249.06	1249.84
94	0800	1249.89	1249.71	1249.68	1250.31	1248.67	1249.28	1249.92
94	1000	1250.00	1249.83	1249.79	1250.40	1248.83	1249.44	1250.01
94	1200	1250.10	1249.93	1249.90	1250.47	1249.00	1249.57	1250.08
94	1400	1250.15	1249.92	1249.90	1250.54	1248.51	1248.84	1250.16
94	1600	1249.69	1249.59	1249.55	1250.39	1247.15	1247.48	1250.13
94	1800	1249.52	1249.44	1249.40	1250.27	1246.91	1247.34	1250.06
94	2000	1249.36	1249.27	1249.23	1250.11	1246.75	1247.22	1249.92
94	2200	1249.27	1249.18	1249.12	1250.01	1246.66	1247.15	1249.81
95	0000	1249.24	1249.15	1249.08	1249.97	1246.64	1247.12	1249.76
95	0200	1249.19	1249.10	1249.02	1249.90	1246.60	1247.09	1249.69
95	0400	1249.16	1249.06	1248.98	1249.86	1246.57	1247.07	1249.65
95	0600	1249.11	1249.03	1248.94	1249.82	1246.55	1247.04	1249.59
95	0800	1249.08	1248.99	1248.89	1249.76	1246.50	1247.02	1249.54
95	1000	1249.07	1248.99	1248.88	1249.75	1246.50	1247.02	1249.52
95	1200	1249.10	1249.00	1248.90	1249.77	1246.53	1247.03	1249.53
95	1400	1249.10	1249.00	1248.90	1249.79	1246.51	1246.99	1249.55
95	1600	1248.85	1248.77	1248.78	1249.77	1245.53	1247.98	1249.56
95	1800	1248.64	1248.59	1248.69	1249.74	1245.33	1248.03	1249.54
95	2000	1248.51	1248.46	1248.59	1249.65	1245.15	1247.98	1249.47
95	2200	1248.44	1248.38	1248.54	1249.61	1245.11	1247.95	1249.43
96	0000	1248.36	1248.31	1248.48	1249.56	1245.06	1247.91	1249.38

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
96	0200	1248.36	1248.31	1248.47	1249.57	1245.07	1247.92	1249.38
96	0400	1248.34	1248.29	1248.47	1249.56	1245.06	1247.93	1249.38
96	0600	1248.30	1248.26	1248.43	1249.52	1245.04	1247.90	1249.34
96	0800	1248.24	1248.20	1248.37	1249.47	1244.99	1247.86	1249.28
96	1000	1248.22	1248.18	1248.35	1249.45	1244.97	1247.85	1249.25
96	1200	1248.26	1248.22	1248.40	1249.49	1245.01	1247.89	1249.29
96	1400	1248.28	1248.24	1248.42	1249.52	1245.02	1247.92	1249.33
96	1600	1248.40	1248.35	1248.51	1249.59	1245.58	1247.85	1249.39
96	1800	1248.91	1248.84	1248.90	1249.75	1247.46	1248.56	1249.46
96	2000	1249.35	1249.21	1249.20	1249.88	1248.22	1248.99	1249.53
96	2200	1249.58	1249.43	1249.39	1250.00	1248.60	1249.21	1249.60
97	0000	1249.76	1249.61	1249.56	1250.12	1248.86	1249.39	1249.72
97	0200	1249.87	1249.71	1249.66	1250.20	1249.02	1249.51	1249.78
97	0400	1249.98	1249.83	1249.76	1250.29	1249.18	1249.61	1249.86
97	0600	1250.04	1249.89	1249.83	1250.34	1249.27	1249.68	1249.92
97	0800	1250.10	1249.94	1249.88	1250.37	1249.30	1249.73	1249.95
97	1000	1250.17	1250.01	1249.95	1250.43	1249.42	1249.80	1250.01
97	1200	1250.26	1250.11	1250.04	1250.51	1249.54	1249.89	1250.10
97	1400	1250.36	1250.21	1250.15	1250.61	1249.68	1249.98	1250.20
97	1600	1250.46	1250.29	1250.24	1250.70	1249.74	1250.07	1250.30
97	1800	1250.50	1250.34	1250.29	1250.74	1249.80	1250.11	1250.36
97	2000	1250.54	1250.38	1250.34	1250.78	1249.85	1250.15	1250.40
97	2200	1250.57	1250.40	1250.37	1250.81	1249.89	1250.19	1250.43
98	0000	1250.61	1250.43	1250.41	1250.84	1249.94	1250.23	1250.47
98	0200	1250.64	1250.48	1250.45	1250.87	1250.00	1250.26	1250.50
98	0400	1250.70	1250.52	1250.50	1250.91	1250.06	1250.30	1250.54
98	0600	1250.74	1250.56	1250.55	1250.95	1250.11	1250.35	1250.59
98	0800	1250.76	1250.58	1250.55	1250.97	1250.11	1250.36	1250.60
98	1000	1250.77	1250.59	1250.57	1250.98	1250.14	1250.38	1250.62
98	1200	1250.81	1250.63	1250.61	1251.01	1250.21	1250.42	1250.66
98	1400	1250.83	1250.65	1250.64	1251.03	1250.24	1250.44	1250.69
98	1600	1250.85	1250.68	1250.66	1251.05	1250.25	1250.47	1250.71
98	1800	1250.85	1250.67	1250.66	1251.04	1250.28	1250.46	1250.70
98	2000	1250.80	1250.62	1250.60	1250.98	1250.24	1250.42	1250.64
98	2200	1250.77	1250.59	1250.56	1250.94	1250.22	1250.39	1250.60
99	0000	1250.77	1250.58	1250.55	1250.91	1250.23	1250.39	1250.58
99	0200	1250.77	1250.59	1250.55	1250.91	1250.24	1250.40	1250.57
99	0400	1250.77	1250.58	1250.54	1250.90	1250.24	1250.40	1250.56
99	0600	1250.75	1250.57	1250.52	1250.87	1250.24	1250.39	1250.53
99	0800	1250.72	1250.55	1250.48	1250.83	1250.21	1250.37	1250.49
99	1000	1250.75	1250.57	1250.50	1250.84	1250.29	1250.38	1250.50
99	1200	1250.78	1250.60	1250.53	1250.87	1250.26	1250.41	1250.52
99	1400	1250.58	1250.48	1250.38	1250.82	1248.45	1248.24	1250.51
99	1600	1250.55	1250.41	1250.20	1250.69	1247.70	1247.78	1250.49
99	1800	1250.43	1250.30	1250.07	1250.59	1247.49	1247.67	1250.43
99	2000	1250.34	1250.21	1249.97	1250.49	1247.35	1247.62	1250.35
99	2200	1250.31	1250.18	1249.95	1250.47	1247.39	1247.76	1250.33
100	0000	1250.29	1250.16	1249.92	1250.43	1247.39	1247.76	1250.29
100	0200	1250.29	1250.16	1249.91	1250.43	1247.38	1247.77	1250.28
100	0400	1250.28	1250.15	1249.91	1250.42	1247.39	1247.81	1250.27
100	0600	1250.27	1250.14	1249.91	1250.40	1248.04	1248.25	1250.24

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
100	0800	1250.38	1250.23	1250.09	1250.50	1249.14	1249.65	1250.26
100	1000	1250.50	1250.33	1250.21	1250.59	1249.49	1249.90	1250.31
100	1200	1250.59	1250.42	1250.32	1250.67	1249.68	1250.05	1250.37
100	1400	1250.65	1250.48	1250.39	1250.73	1249.95	1250.15	1250.43
100	1600	1250.73	1250.55	1250.46	1250.79	1250.01	1250.24	1250.49
100	1800	1250.73	1250.57	1250.48	1250.81	1250.09	1250.29	1250.51
100	2000	1250.72	1250.55	1250.47	1250.80	1250.10	1250.29	1250.49
100	2200	1250.71	1250.54	1250.45	1250.77	1250.12	1250.29	1250.47
101	0000	1250.74	1250.58	1250.48	1250.80	1250.17	1250.33	1250.49
101	0200	1250.77	1250.61	1250.51	1250.82	1250.23	1250.37	1250.52
101	0400	1250.79	1250.62	1250.54	1250.84	1250.25	1250.39	1250.54
101	0600	1250.80	1250.63	1250.55	1250.84	1250.27	1250.41	1250.54
101	0800	1250.78	1250.62	1250.52	1250.82	1250.24	1250.40	1250.52
101	1000	1250.82	1250.65	1250.56	1250.85	1250.31	1250.44	1250.55
101	1200	1250.87	1250.71	1250.62	1250.90	1250.37	1250.49	1250.61
101	1400	1250.95	1250.79	1250.70	1250.99	1250.44	1250.56	1250.69
101	1600	1251.01	1250.84	1250.77	1251.05	1250.50	1250.61	1250.77
101	1800	1251.03	1250.86	1250.80	1251.08	1250.54	1250.64	1250.80
101	2000	1251.01	1250.84	1250.79	1251.07	1250.51	1250.63	1250.80
101	2200	1251.02	1250.86	1250.81	1251.08	1250.53	1250.65	1250.81
102	0000	1251.05	1250.88	1250.83	1251.10	1250.55	1250.67	1250.84
102	0200	1251.09	1250.92	1250.87	1251.14	1250.58	1250.70	1250.88
102	0400	1251.10	1250.92	1250.88	1251.15	1250.60	1250.71	1250.89
102	0600	1251.09	1250.92	1250.88	1251.15	1250.59	1250.71	1250.89
102	0800	1251.07	1250.90	1250.86	1251.12	1250.48	1250.70	1250.88
102	1000	1251.08	1250.91	1250.87	1251.12	1250.53	1250.70	1250.88
102	1200	1251.14	1250.96	1250.92	1251.17	1250.64	1250.75	1250.93
102	1400	1251.19	1251.02	1250.99	1251.23	1250.69	1250.80	1251.00
102	1600	1251.21	1251.04	1251.01	1251.26	1250.74	1250.83	1251.03
102	1800	1251.18	1251.02	1250.99	1251.24	1250.72	1250.81	1251.02
102	2000	1251.17	1251.00	1250.98	1251.22	1250.69	1250.81	1251.01
102	2200	1251.15	1250.99	1250.96	1251.20	1250.69	1250.79	1250.99
103	0000	1251.16	1251.00	1250.96	1251.20	1250.70	1250.79	1250.99
103	0200	1251.15	1250.99	1250.96	1251.19	1250.69	1250.79	1250.98
103	0400	1251.15	1250.99	1250.96	1251.19	1250.70	1250.80	1250.97
103	0600	1251.12	1250.95	1250.91	1251.15	1250.72	1250.77	1250.93
103	0800	1251.06	1250.89	1250.85	1251.07	1250.61	1250.71	1250.86
103	1000	1251.07	1250.91	1250.85	1251.07	1250.62	1250.72	1250.86
103	1200	1251.12	1250.96	1250.90	1251.12	1250.73	1250.76	1250.88
103	1400	1251.16	1250.99	1250.94	1251.16	1250.74	1250.80	1250.93
103	1600	1251.20	1251.04	1250.99	1251.20	1250.73	1250.84	1250.99
103	1800	1251.18	1251.03	1250.98	1251.19	1250.76	1250.83	1250.99
103	2000	1251.17	1251.02	1250.98	1251.18	1250.75	1250.83	1250.98
103	2200	1251.13	1250.97	1250.93	1251.13	1250.72	1250.79	1250.94
104	0000	1251.10	1250.95	1250.89	1251.09	1250.69	1250.76	1250.90
104	0200	1251.12	1250.97	1250.91	1251.11	1250.72	1250.78	1250.91
104	0400	1251.16	1251.00	1250.94	1251.13	1250.76	1250.81	1250.93
104	0600	1251.15	1251.00	1250.94	1251.13	1250.74	1250.81	1250.93
104	0800	1251.16	1251.01	1250.94	1251.13	1250.74	1250.82	1250.94
104	1000	1251.16	1251.00	1250.94	1251.12	1250.73	1250.81	1250.92
104	1200	1251.19	1251.04	1250.99	1251.16	1250.74	1250.84	1250.97

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
104	1400	1251.26	1251.11	1251.06	1251.24	1250.85	1250.90	1251.04
104	1600	1251.32	1251.17	1251.12	1251.30	1250.90	1250.96	1251.12
104	1800	1251.38	1251.19	1251.15	1251.33	1250.96	1250.98	1251.16
104	2000	1251.35	1251.21	1251.17	1251.35	1250.92	1250.99	1251.19
104	2200	1251.35	1251.20	1251.17	1251.34	1250.92	1250.99	1251.18
105	0000	1251.31	1251.15	1251.13	1251.31	1250.89	1250.97	1251.14
105	0200	1251.32	1251.17	1251.14	1251.31	1250.90	1250.96	1251.15
105	0400	1251.31	1251.15	1251.12	1251.30	1250.90	1250.96	1251.14
105	0600	1251.27	1251.12	1251.08	1251.25	1250.86	1250.93	1251.11
105	0800	1251.24	1251.09	1251.05	1251.21	1250.83	1250.89	1251.06
105	1000	1251.21	1251.06	1251.01	1251.16	1250.81	1250.87	1251.02
105	1200	1251.17	1251.02	1250.97	1251.12	1250.81	1250.84	1250.97
105	1400	1251.15	1251.00	1250.94	1251.08	1250.80	1250.82	1250.92
105	1600	1251.11	1250.96	1250.89	1251.04	1250.77	1250.79	1250.87
105	1800	1251.07	1250.92	1250.84	1250.99	1250.72	1250.76	1250.82
105	2000	1251.03	1250.89	1250.80	1250.92	1250.69	1250.73	1250.77
105	2200	1251.02	1250.89	1250.78	1250.91	1250.69	1250.71	1250.74
106	0000	1251.04	1250.90	1250.80	1250.92	1250.72	1250.73	1250.74
106	0200	1251.06	1250.92	1250.81	1250.92	1250.74	1250.74	1250.76
106	0400	1251.06	1250.93	1250.82	1250.93	1250.74	1250.76	1250.76
106	0600	1251.05	1250.92	1250.81	1250.91	1250.73	1250.75	1250.75
106	0800	1251.03	1250.90	1250.78	1250.88	1250.70	1250.73	1250.72
106	1000	1251.01	1250.88	1250.75	1250.85	1250.64	1250.72	1250.69
106	1200	1251.00	1250.92	1250.80	1250.89	1250.70	1250.75	1250.73
106	1400	1251.12	1250.99	1250.86	1250.95	1250.81	1250.80	1250.79
106	1600	1251.15	1251.02	1250.90	1250.98	1250.86	1250.84	1250.83
106	1800	1251.16	1251.03	1250.92	1250.99	1250.84	1250.84	1250.85
106	2000	1251.16	1251.03	1250.91	1250.99	1250.83	1250.84	1250.85
106	2200	1251.14	1251.01	1250.89	1250.97	1250.80	1250.83	1250.83
107	0000	1251.16	1251.03	1250.91	1250.98	1250.84	1250.84	1250.85
107	0200	1251.18	1251.05	1250.93	1250.99	1250.85	1250.86	1250.87
107	0400	1251.18	1251.05	1250.94	1251.01	1250.85	1250.86	1250.87
107	0600	1251.17	1251.04	1250.93	1250.99	1250.83	1250.85	1250.87
107	0800	1251.17	1251.04	1250.92	1250.99	1250.80	1250.85	1250.86
107	1000	1251.19	1251.06	1250.95	1251.00	1250.84	1250.86	1250.88
107	1200	1251.24	1251.11	1251.00	1251.06	1250.89	1250.90	1250.93
107	1400	1251.30	1251.18	1251.07	1251.12	1250.91	1250.95	1251.01
107	1600	1251.35	1251.22	1251.13	1251.17	1251.00	1251.01	1251.08
107	1800	1251.37	1251.24	1251.14	1251.20	1251.04	1251.02	1251.11
107	2000	1251.34	1251.21	1251.13	1251.18	1250.97	1251.01	1251.09
107	2200	1251.31	1251.19	1251.10	1251.15	1250.95	1250.98	1251.07
108	0000	1251.34	1251.20	1251.12	1251.17	1250.97	1251.00	1251.09
108	0200	1251.37	1251.24	1251.16	1251.21	1251.01	1251.02	1251.12
108	0400	1251.37	1251.24	1251.18	1251.23	1251.01	1251.04	1251.14
108	0600	1251.36	1251.23	1251.16	1251.21	1251.00	1251.03	1251.13
108	0800	1251.35	1251.22	1251.15	1251.20	1250.97	1251.01	1251.12
108	1000	1251.37	1251.24	1251.17	1251.20	1251.06	1251.03	1251.13
108	1200	1251.42	1251.29	1251.22	1251.26	1251.03	1251.07	1251.19
108	1400	1251.46	1251.33	1251.26	1251.30	1251.08	1251.10	1251.23
108	1600	1251.49	1251.35	1251.30	1251.33	1251.11	1251.14	1251.28
108	1800	1251.47	1251.34	1251.29	1251.32	1251.09	1251.12	1251.27

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
108	2000	1251.47	1251.33	1251.29	1251.33	1251.09	1251.12	1251.28
108	2200	1251.44	1251.31	1251.26	1251.29	1251.07	1251.10	1251.25
109	0000	1251.45	1251.31	1251.26	1251.29	1251.06	1251.10	1251.25
109	0200	1251.47	1251.33	1251.29	1251.32	1251.09	1251.12	1251.28
109	0400	1251.46	1251.33	1251.27	1251.31	1251.08	1251.11	1251.27
109	0600	1251.42	1251.28	1251.23	1251.26	1251.04	1251.09	1251.22
109	0800	1251.36	1251.22	1251.17	1251.19	1250.97	1251.04	1251.15
109	1000	1251.32	1251.18	1251.12	1251.14	1250.95	1251.01	1251.10
109	1200	1251.33	1251.20	1251.13	1251.14	1250.97	1251.00	1251.11
109	1400	1251.35	1251.23	1251.15	1251.16	1251.00	1251.01	1251.12
109	1600	1251.41	1251.27	1251.19	1251.20	1251.14	1251.06	1251.15
109	1800	1251.45	1251.27	1251.20	1251.21	1251.10	1251.07	1251.17
109	2000	1251.39	1251.27	1251.19	1251.20	1251.06	1251.07	1251.17
109	2200	1251.42	1251.29	1251.22	1251.23	1251.07	1251.08	1251.19
110	0000	1251.47	1251.35	1251.27	1251.28	1251.12	1251.12	1251.25
110	0200	1251.52	1251.40	1251.34	1251.34	1251.16	1251.17	1251.31
110	0400	1251.53	1251.40	1251.36	1251.35	1251.16	1251.19	1251.33
110	0600	1251.50	1251.38	1251.33	1251.33	1251.14	1251.18	1251.32
110	0800	1250.58	1250.84	1251.09	1251.19	1250.54	1250.38	1251.24
110	1000	1250.66	1250.50	1250.38	1250.86	1250.09	1247.33	1251.09
110	1200	1250.38	1250.12	1249.97	1250.58	1249.65	1246.71	1250.93
110	1400	1250.23	1249.93	1249.75	1250.43	1249.44	1246.46	1250.82
110	1600	1250.11	1249.76	1249.59	1250.30	1249.26	1246.30	1250.72
110	1800	1250.01	1249.66	1249.48	1250.20	1249.11	1246.19	1250.62
110	2000	1249.89	1249.53	1249.34	1250.06	1248.99	1246.08	1250.50
110	2200	1249.75	1249.38	1249.18	1249.94	1248.84	1245.96	1250.35
111	0000	1249.60	1249.23	1249.01	1249.79	1248.70	1245.83	1250.18
111	0200	1249.56	1249.18	1248.95	1249.73	1248.66	1245.78	1250.11
111	0400	1249.49	1249.10	1248.87	1249.65	1248.59	1245.73	1250.04
111	0600	1249.43	1249.04	1248.80	1249.59	1248.53	1245.68	1249.96
111	0800	1249.42	1249.04	1248.79	1249.57	1248.54	1245.65	1249.94
111	1000	1249.40	1249.01	1248.75	1249.56	1248.47	1245.63	1249.91
111	1200	1249.39	1249.00	1248.75	1249.56	1248.56	1245.59	1249.90
111	1400	1249.42	1249.03	1248.77	1249.59	1248.53	1245.59	1249.94
111	1600	1249.45	1249.06	1248.80	1249.62	1248.49	1245.61	1249.97
111	1800	1249.45	1249.06	1248.80	1249.64	1248.55	1245.60	1249.99
111	2000	1249.40	1249.01	1248.76	1249.59	1248.47	1245.56	1249.94
111	2200	1249.38	1248.98	1248.74	1249.58	1248.45	1245.57	1249.92
112	0000	1249.39	1249.00	1248.75	1249.59	1248.45	1245.58	1249.93
112	0200	1249.39	1249.00	1248.75	1249.60	1248.44	1245.59	1249.93
112	0400	1249.37	1248.98	1248.74	1249.59	1248.42	1245.60	1249.92
112	0600	1249.37	1248.99	1248.74	1249.60	1248.42	1245.60	1249.93
112	0800	1249.36	1248.98	1248.74	1249.59	1248.38	1245.59	1249.93
112	1000	1249.36	1248.96	1248.72	1249.59	1248.43	1245.56	1249.92
112	1200	1249.37	1248.98	1248.74	1249.61	1248.36	1245.55	1249.94
112	1400	1249.41	1249.01	1248.77	1249.64	1248.42	1245.57	1249.98
112	1600	1249.47	1249.08	1248.85	1249.72	1248.46	1245.62	1250.07
112	1800	1249.44	1249.04	1248.83	1249.70	1248.44	1245.60	1250.04
112	2000	1249.37	1248.98	1248.75	1249.64	1248.34	1245.55	1249.99
112	2200	1249.31	1248.92	1248.69	1249.59	1248.29	1245.48	1249.93
113	0000	1249.27	1248.88	1248.66	1249.54	1248.24	1245.44	1249.88

Day of 1996	Time	CH1 SWT GW2	CH2 SWT GW3	CH3 SWT GW7	CH4 SWT GW1	CH6 SWT GW4	CH7 SWT GW6	CH8 SWT GW8
113	0200	1249.19	1248.80	1248.57	1249.47	1248.15	1245.40	1249.79
113	0400	1249.17	1248.77	1248.54	1249.42	1248.17	1245.36	1249.75
113	0600	1249.09	1248.70	1248.45	1249.35	1248.09	1245.33	

APPENDIX E

LABORATORY ANALYTICAL REPORTS

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-4996
Attn: Amanda Bush

Sampled: 02/13/96 Received: 02/14/96 Analyzed: 02/21/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Purgeable Quantitated As Gasoline
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - Method 624/8240

Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-1 /BMI021496-01	Benzene	280	50 ug/L
	Toluene	14,000	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	610	50 ug/L
SWT-TT-2 /BMI021496-02	TPH (Purgeable)	15	13 mg/L

ND - Not Detected

Approved by: Roger L. Scholl Date: 2/22/96
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
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e-mail: alpha@powernet.net
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2505 Chandler Avenue, Suite 1
Las Vegas, Nevada 89120
(702) 498-3312
FAX: 702-736-7523
1-800-283-1183

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-4996
Attn: Amanda Bush

Sampled: 05/07/96 Received: 05/08/96 Analyzed: 05/11-15/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit	
SWT-TT-3 /BMI050896-01	Benzene	120	10	ug/L
	Toluene	5,500	10	ug/L
	Ethylbenzene	14	10	ug/L
	Total Xylenes	300	10	ug/L
SWT-TT-4 /BMI050896-02	TPH *	2.3	0.50	mg/L

* - Components are in the range of gasoline.

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

Approved By: Roger L. Scholl Date: 5/16/96
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
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Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
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2505 Chandler Avenue, Suite 1
Las Vegas, Nevada 89120
(702) 498-3312
FAX: 702-736-7523
1-800-283-1183

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-4996
Attn: Amanda Bush

Sampled: 05/07/96 Received: 05/08/96 Analyzed: 05/11/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Purgeable Quantitated As Gasoline

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191

Results:

Client ID/ Lab ID	Parameter	Concentration mg/L	Detection Limit mg/L
SWT-TT-3 /BMI050896-01	TPH (Purgeable)	6.3	5.0

Note: The sample was received in a liter bottle instead of a VOA Vial which is standard for this analysis.

Approved by: Roger L. Scholl Date: 7/23/96
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

e-mail: alpha@powernet.net
http//www.powernet.net/~alpha

2505 Chandler Avenue, Suite 1
Las Vegas, Nevada 89120
(702) 498-3312
FAX: 702-736-7523
1-800-283-1183

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 05/09/96 Received: 05/10/96 Analyzed: 05/16-22/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-5 /BMI051096-01	TPH *	2.3	0.50 mg/L
	Benzene	130	10 ug/L
	Toluene	5,500	10 ug/L
	Ethylbenzene	13	10 ug/L
	Total Xylenes	310	10 ug/L
SWT-TT-6 /BMI051096-02	TPH *	1.7	0.50 mg/L
	Benzene	120	10 ug/L
	Toluene	5,500	10 ug/L
	Ethylbenzene	13	10 ug/L
	Total Xylenes	310	10 ug/L

* - Components are in the range of gasoline.

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

Approved By: Roger L. Scholl Date: 5/24/96
Roger L. Scholl, Ph.D.
Laboratory Director

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1-800-283-1183

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 05/09/96 Received: 05/10/96 Analyzed: 05/16/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Purgeable Quantitated As Gasoline

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191

Results:

Client ID/ Lab ID	Parameter	Concentration mg/L	Detection Limit mg/L
SWT-TT-5 /BMI051096-01	TPH (Purgeable)	7.2	5.0
SWT-TT-6 /BMI051096-02	TPH (Purgeable)	6.5	5.0

Approved by: Roger L. Scholl Date: 7/23/96
Roger L. Scholl, Ph.D.
Laboratory Director

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ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 05/15/96 Received: 05/16/96 Analyzed: 05/22-23/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-7 /BMI051696-03	TPH *	1.8	0.50 mg/L
	Benzene	79	50 ug/L
	Toluene	5,100	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	300	50 ug/L
SWT-TT-8 /BMI051696-04	TPH *	2.5	0.50 mg/L
	Benzene	62	50 ug/L
	Toluene	3,400	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	170	50 ug/L

* - Components are in the range of gasoline.
Note: Hydrocarbons outside the range of diesel may have varying recoveries.

Note: Samples for BTXE were received in liter bottles instead of VOA Vials which are standard for this analysis.

ND - Not Detected

Approved By: Roger L. Scholl Date: 5/29/96
Roger L. Scholl, Ph.D.
Laboratory Director

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ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 05/15/96 Received: 05/16/96 Analyzed: 05/23/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Purgeable Quantitated As Gasoline

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191

Results:

Client ID/ Lab ID	Parameter	Concentration mg/L	Detection Limit mg/L
SWT-TT-7 /BMI051696-03	TPH (Purgeable)	ND	25
SWT-TT-8 /BMI051696-04	TPH (Purgeable)	ND	25

Note: Samples for TPH Gasoline were received in liter bottles instead of VOA Vials which are standard for this analysis.

ND - Not Detected

Approved by: Roger L. Scholl Date: 7/23/96
Roger L. Scholl, Ph.D.
Laboratory Director

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ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 05/20/96 Received: 05/21/96 Analyzed: 05/24/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-9 /BMI052196-01	TPH *	1.6	0.50 mg/L
	Benzene	68	50 ug/L
	Toluene	4,700	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	250	50 ug/L
SWT-TT-10 /BMI052196-02	TPH *	2.2	0.50 mg/L
	Benzene	72	50 ug/L
	Toluene	4,800	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	220	50 ug/L

* - Components are in the range of gasoline.
Note: Hydrocarbons outside the range of diesel may have varying recoveries.

Note: Samples for BTXE were received in liter bottles instead of VOA Vials which is standard for this analysis.

ND - Not Detected

Approved By: Roger E. Scholl Date: 5/29/96
Roger E. Scholl, Ph.D.
Laboratory Director

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FAX: 702-736-7523
1-800-283-1183

ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#: 114712
Phone: (614) 424-4996
Attn: Amanda Bush

Sampled: 05/30/96 Received: 06/03/96 Analyzed: 06/05-06/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-11 /BMI060396-01	TPH *	3.8	0.50 mg/L
	Benzene	120	50 ug/L
	Toluene	4,800	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	250	50 ug/L
SWT-TT-12 /BMI060396-02	TPH *	3.5	0.50 mg/L
	Benzene	120	50 ug/L
	Toluene	4,700	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	220	50 ug/L

* - Components are in the range of gasoline and kerosene.
Note: Hydrocarbons outside the range of diesel may have varying recoveries.

Note: Samples for BTXE were received in liter bottles instead of VOA Vials which is standard for this analysis.

ND - Not Detected

Approved By: Walter Hinchman Date: 6/12/96
Walter Hinchman
Quality Control Officer

Alpha Analytical, Inc.
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ANALYTICAL REPORT

Battelle
505 King Ave
Columbus Ohio 43201

Job#:
Phone: (614) 424-6199
Attn: Amanda Bush

Sampled: 06/07/96 Received: 06/10/96 Analyzed: 06/11/96

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTEX - Benzene,Toluene,Ethylbenzene,Xylenes

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTEX - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
SWT-TT-13 /BMI061096-01	TPH *	2.1	0.50 mg/L
	Benzene	110	50 ug/L
	Toluene	5,000	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	250	50 ug/L
SWT-TT-14 /BMI061096-02	TPH *	1.9	0.50 mg/L
	Benzene	110	50 ug/L
	Toluene	5,000	50 ug/L
	Ethylbenzene	ND	50 ug/L
	Total Xylenes	260	50 ug/L

* - Components are in the range of gasoline.

ND - Not Detected

Approved By: Walter Hinchman Date: 6/13/96
Walter Hinchman
Quality Control Officer

Tinker AFB, OK
Southwest Tanks
Bioventing/Bioslurping
Liquid Ring Pump Stack Gas Collected 22 November, 1995
Analytical Method: Modified EPA Method TO - 14

Regulatory Limit = 0.5 lb Benzene/hour

Compound	Amount ppmv	Amount ug/L	Q = (cfm) 20 Discharge lb/hr	Q = (cfm) 30 Discharge lb/hr	Q = (cfm) 40 Discharge lb/hr	Q = (cfm) 50 Discharge lb/hr
Benzene	18	57	0.00427	0.00641	0.00854	0.01068
Toluene	579	2209	0.16550	0.24825	0.33100	0.41375
Ethylbenzene	2	11	0.00082	0.00124	0.00165	0.00206
m&p - Xylenes	10	43	0.00322	0.00483	0.00644	0.00805
o - Xylene	5	24	0.00180	0.00270	0.00360	0.00450
TPH (as C6)	3153	10247	0.76771	1.15157	1.53542	1.91928

Conversions used:

1 ug =	1,000,000	g
1 g =	0.002205	lb
1 L =	0.035311	ft^3
1 lb =	453.6	g
1 ft^3 =	28.32	L
1 hr =	60	min

Formula Used:

(ug/L) * (1 g/1,000,000 ug) * (1 lb/453.6 g) * (28.32 L/ft^3) * (60 min/hr) * (Q ft^3/min) = lb/hr

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9602117

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	9644
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	2/14/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	2/26/96	**AMOUNT$:**	$158.38

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-2	TO-3	3.5 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00
	Shipping (1/26/96)	$23.38

CERTIFIED BY: Isabella C Cuma

Laboratory Director

DATE: 2/26/96

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 • F 6) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-2
ID#: 9602117-01A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6022234**	**Date of Collection: 2/13/96**	
Dil. Factor:	**763**	**Date of Analysis: 2/22/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.76	2.5	60	190
Toluene	0.76	2.9	530	2000
Ethyl Benzene	0.76	3.4	4.6	20
Total Xylenes	0.76	3.4	49 M	220 M

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name:	**6022234**	**Date of Collection: 2/13/96**	
Dil. Factor:	**763**	**Date of Analysis: 2/22/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	7.6	49	55000	360000

*TPH referenced to JP-4 Jet Fuel (MW=156)

M = Reported value may be biased due to apparent matrix interferences.

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank
ID#: 9602117-02A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6022232**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/22/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
T ene	0.001	0.004	Not Detected	Not Detected
Benzene	0.001	0.004	Not Detected	Not Detected
Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name:	**6022232**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/22/96**	

mpound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
(C2+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected

TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9602259

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	9784
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	2/29/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	3/6/96	**AMOUNT$:**	$135.00

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-3	TO-3	1.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00

CERTIFIED BY: Daniela L Freeman

Laboratory Director

DATE: 3/7/96

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 • FAX (916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-3

ID#: 9602259-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6030506**	**Date of Collection: 2/28/96**	
Dil. Factor:	**2090**	**Date of Analysis: 3/5/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	2.1	6.8	130	420
Toluene	2.1	8.0	1100	4200
Ethyl Benzene	2.1	9.2	7.8	34
Total Xylenes	2.1	9.2	77	340

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6030506**	**Date of Collection: 2/28/96**	
Dil. Factor:	**2090**	**Date of Analysis: 3/5/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	21	140	16000	100000

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 9602259-02A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6030505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/5/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6030505**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/5/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9604270

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10301
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	4/29/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	5/2/96	**AMOUNT$:**	$159.41

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-4	TO-3	1.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00
	Shipping (3/26/96)	$24.41

CERTIFIED BY: _____ DATE: 5/3/96

Laboratory Director

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 • F 16) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-4

ID#: 9604270-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6043010**	**Date of Collection: 4/26/96**	
Dil. Factor:	**746**	**Date of Analysis: 4/30/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.75	2.4	64	210
Toluene	0.75	2.9	440	1700
Ethyl Benzene	0.75	3.3	3.8	17
Total Xylenes	0.75	3.3	39	170

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6043010**	**Date of Collection: 4/26/96**	
Dil. Factor:	**746**	**Date of Analysis: 4/30/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	7.5	48	66000	430000

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 9604270-02A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6043006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/30/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6043006**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/30/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9605110

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10393
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	5/10/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	5/15/96	**AMOUNT$:**	$135.00

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT - AE - 5	TO-3	3.5 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00

CERTIFIED BY: Linda D. Fruman
Laboratory Director

DATE: 5/15/96

AIR TOXICS LTD.

SAMPLE NAME: SWT - AE - 5

ID#: 9605110-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6051113**	**Date of Collection: 5/9/96**	
Dil. Factor:	**1140**	**Date of Analysis: 5/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	1.1	3.7	65	210
Toluene	1.1	4.4	580	2200
Ethyl Benzene	1.1	5.0	5.2	23
Total Xylenes	1.1	5.0	55	240

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6051113**	**Date of Collection: 5/9/96**	
Dil. Factor:	**1140**	**Date of Analysis: 5/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	11	74	64000	420000

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank
ID#: 9605110-02A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6051105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name:	**6051105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C2+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9605178

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10466
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	5/21/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	5/24/96	**AMOUNT$:**	$148.96

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-6	TO-3	5.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00
	Shipping (5/15/96)	$13.96

CERTIFIED BY: Linda L. Fuerman — Laboratory Director

DATE: 5/24/96

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-6

ID#: 9605178-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6052210**	**Date of Collection: 5/20/96**	
Dil. Factor:	**1210**	**Date of Analysis: 5/22/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	1.2	3.9	5.5	18
Toluene	1.2	4.6	420	1600
Ethyl Benzene	1.2	5.3	3.5	15
Total Xylenes	1.2	5.3	46	200

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6052210**	**Date of Collection: 5/20/96**	
Dil. Factor:	**1210**	**Date of Analysis: 5/22/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	12	78	6200	40000
C2 - C4** Hydrocarbons	12	22	1100	2000

*TPH referenced to JP-4 Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 9605178-02A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

lame:	6052206		Date of Collection: NA	
actor:	1.00		Date of Analysis: 5/22/96	
mpound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
enzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	6052206		Date of Collection: NA	
Factor:	1.00		Date of Analysis: 5/22/96	
mpound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
H* (C5+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected
2 - C4** Hydrocarbons	0.010	0.018	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9605195

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10491
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	5/22/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	5/28/96	**AMOUNT$:**	$135.00

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-7	TO-3	6.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00

CERTIFIED BY: Linda J. Fruman
Laboratory Director

DATE: 5/28/96

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 • 159 916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-7
ID#: 9605195-01A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name: 6052311 **Date of Collection: 5/21/96**
Dil. Factor: 1580 **Date of Analysis: 5/23/96**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	1.6	5.1	86 M	280 M
Toluene	1.6	6.1	520	2000
Ethyl Benzene	1.6	7.0	7.6	34
Total Xylenes	1.6	7.0	64 M	280 M

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name: 6052311 **Date of Collection: 5/21/96**
Factor: 1580 **Date of Analysis: 5/23/96**

pound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
(C5+ Hydrocarbons)	16	100	6600	43000
- C4** Hydrocarbons	16	29	1400	2600

*TPH referenced to JP-4 Jet Fuel (MW=156)
**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

M = Reported value may be biased due to apparent matrix interferences.

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank
ID#: 9605195-02A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6052307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/23/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name:	**6052307**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/23/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected
C2 - C4** Hydrocarbons	0.010	0.018	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)
**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9606090

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10674
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	6/10/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	6/18/96	**AMOUNT$:**	$153.89

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-8	TO-3	0.5 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC
Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.			$15.00
	Shipping (6/3/96)			$18.89

CERTIFIED BY: Robert Feldman
Laboratory Director

DATE: 6/19/96

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 • FAX (916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-8

ID#: 9606090-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6061110**	**Date of Collection: 6/7/96**	
Dil. Factor:	**2560**	**Date of Analysis: 6/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	2.6	8.3	65	210
Toluene	2.6	9.8	360	1400
Ethyl Benzene	2.6	11	9.5	42
Total Xylenes	2.6	11	54	240

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as Jet Fuel)

File Name:	**6061110**	**Date of Collection: 6/7/96**	
Dil. Factor:	**2560**	**Date of Analysis: 6/11/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	26	170	18000	120000
C2 - C4** Hydrocarbons	26	47	4800	8800

*TPH referenced to Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 9606090-02A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6061107**		**Date of Collection: NA**	
Dil. Factor:	**1.00**		**Date of Analysis: 6/11/96**	
Compound	**Det. Limit (ppmv)**	**Det. Limit (uG/L)**	**Amount (ppmv)**	**Amount (uG/L)**
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0,004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as Jet Fuel)

File Name:	**6061107**		**Date of Collection: NA**	
Dil. Factor:	**1.00**		**Date of Analysis: 6/11/96**	
Compound	**Det. Limit (ppmv)**	**Det. Limit (uG/L)**	**Amount (ppmv)**	**Amount (uG/L)**
TPH* (C5+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected
C2 - C4** Hydrocarbons	0.010	0.018	Not Detected	Not Detected

*TPH referenced to Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9606189

Work Order Summary

CLIENT:	Ms. Amanda Bush Battelle Memorial Institute 505 King Avenue Columbus, OH 43201-2693	**BILL TO:** Same	
PHONE:	614-424-4996	**INVOICE #**	10738
FAX:	614-424-3667	**P.O. #**	114718
DATE RECEIVED:	6/18/96	**PROJECT #**	Southwest Tanks
DATE COMPLETED:	6/25/96	**AMOUNT$:**	$135.00

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-9	TO-3	3.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC

Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.	$15.00

CERTIFIED BY: Robert Coleman
Laboratory Director

DATE: 6/25/96

180 BLUE RAVINE ROAD, SUITE B • FOLSOM, CA 95630
(916) 985-1000 · FAX (916) 985-1020

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-9

ID#: 9606189-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name: 6062016 **Date of Collection: 6/17/96**

Dil. Factor: 5600 **Date of Analysis: 6/20/96**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	5.6	18	64	210
Toluene	5.6	21	440	1700
Ethyl Benzene	5.6	25	8.9	39
Total Xylenes	5.6	25	81	360

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name: 6062016 **Date of Collection: 6/17/96**

Dil. Factor: 5600 **Date of Analysis: 6/20/96**

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	56	360	5000	32000
C2 - C4** Hydrocarbons	56	100	1800	3300

*TPH referenced to JP-4 Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank
ID#: 9606189-02A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6062005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 6/20/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name:	**6062005**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 6/20/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	0.010	0.065	Not Detected	Not Detected
C2 - C4** Hydrocarbons	0.010	0.018	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)
**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: NA

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9607024

Work Order Summary

CLIENT: Ms. Amanda Bush
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

BILL TO: Same

PHONE: 614-424-4996
FAX: 614-424-3667
DATE RECEIVED: 7/2/96
DATE COMPLETED: 7/19/96

INVOICE # 11016
P.O. # 114718
PROJECT # Southwest Tanks
AMOUNT$: $135.00

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	PRICE
01A	SWT-AE-Final	TO-3	2.0 "Hg	$120.00
02A	Lab Blank	TO-3	NA	NC
Misc. Charges	1 Liter Summa Canister Preparation (1) @ $15.00 each.			$15.00

CERTIFIED BY: Linda D. Fruman
Laboratory Director

DATE: 7/19/96

AIR TOXICS LTD.

SAMPLE NAME: SWT-AE-Final

ID#: 9607024-01A

EPA METHOD TO-3

(Aromatic Volatile Organics in Air)

GC/PID

File Name:	**6070925**	**Date of Collection: 7/1/96**	
Dil. Factor:	**2700**	**Date of Analysis: 7/9/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	2.7	8.8	99	320
Toluene	2.7	10	950	3600
Ethyl Benzene	2.7	12	18	79
Total Xylenes	2.7	12	120	530

TOTAL PETROLEUM HYDROCARBONS

GC/FID

(Quantitated as JP-4 Jet Fuel)

File Name:	**6070925**	**Date of Collection: 7/1/96**	
Dil. Factor:	**2700**	**Date of Analysis: 7/9/96**	

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	27	180	12000 B	78000 B
C2 - C4** Hydrocarbons	27	49	2600	4800

*TPH referenced to JP-4 Jet Fuel (MW=156)

**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

B = Compound present in laboratory blank, background subtraction not performed.

Container Type: 1 Liter Summa Canister

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank
ID#: 9607024-02A

EPA METHOD TO-3
(Aromatic Volatile Organics in Air)

GC/PID

File Name: 6070923
Dil. Factor: 1.00
Date of Collection: NA
Date of Analysis: 7/9/96

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
Benzene	0.001	0.003	Not Detected	Not Detected
Toluene	0.001	0.004	Not Detected	Not Detected
Ethyl Benzene	0.001	0.004	Not Detected	Not Detected
Total Xylenes	0.001	0.004	Not Detected	Not Detected

TOTAL PETROLEUM HYDROCARBONS
GC/FID
(Quantitated as JP-4 Jet Fuel)

File Name: 6070923
Dil. Factor: 1.00
Date of Collection: NA
Date of Analysis: 7/9/96

Compound	Det. Limit (ppmv)	Det. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH* (C5+ Hydrocarbons)	0.010	0.065	0.017	0.11
C2 - C4** Hydrocarbons	0.010	0.018	Not Detected	Not Detected

*TPH referenced to JP-4 Jet Fuel (MW=156)
**C2 - C4 Hydrocarbons referenced to Propane (MW=44)

Container Type: NA

APPENDIX F

STACK GAS DATA

Stack gas BTEX measurements made by Air Toxics Limited using EPA method TO-3 for aromatic volatile organics in air.

Date (m/d/y)	Sample ID	Measured Benzene (ug/L) [ppmv]	Measured Toluene (ug/L) [ppmv]	Measured Ethylbenzene (ug/L) [ppmv]	Measured Total xylenes (ug/L) [ppmv]
	SWT-AE-1				
2/13/96	SWT-AE-2	190 60	2000 530	20 4.6	220M 49M
2/28/96	SWT-AE-3	420 130	4200 1200	34 7.8	340 77
4/26/96	SWT-AE-4	210 64	1700 440	17 3.8	170 39
5/9/96	SWT-AE-5	210 65	2200 580	23 5.2	240 55
5/20/96	SWT-AE-6	18 5.5	1600 420	15 3.5	200 46
5/21/96	SWT-AE-7	280 M 86 M	2000 520	34 7.6	280 M 64 M
6/7/96	SWT-AE-8	210 65	1400 360	42 9.5	240 54
6/17/96	SWT-AE-9	210 64	1700 440	39 8.9	360 81
7/1/96	SWT-AE-10	320 99	3600 950	79 18	530 120

Size M - Reported value may be biased due to apparent matrix interferences.

Stack gas TPH measurements made by Air Toxics Limited using EPA method TO-3 for TPH.

Date (m/d/y)	Sample ID	Measured TPH (C5+)* (ug/L) [ppmv]	Measured TPH (C2-C4)** (ug/L) [ppmv]	Measured TPH (C2+) (ug/L) [ppmv]
	SWT-AE-1			
2/13/96	SWT-AE-2	NM NM	NM NM	360000 55000
2/28/96	SWT-AE-3	NM NM	NM NM	100000 16000
4/26/96	SWT-AE-4	NM NM	NM NM	430000 66000
5/9/96	SWT-AE-5	NM NM	NM NM	420000 64000
5/20/96	SWT-AE-6	40000 6200	2000 1100	42000† 7300†
5/21/96	SWT-AE-7	43000 6600	2600 1400	45600† 8000†
6/7/96	SWT-AE-8	120000 18000	8800 4800	128800† 22800†
6/17/96	SWT-AE-9	32000 5000	3300 1800	35300† 6800†
7/1/96	SWT-AE-10	78000 12000	4800 2600	82800 14600

* TPH referenced to jet fuel (MW=158)

** C2-C4 hydrocarbons referenced to propane (MW=44)

† calculated as the sum of C2-C4 and the C5+ ranges. Otherwise the value was measured directly by Air Toxics Ltd.

NM - Not measured

APPENDIX G

SOIL GAS MONITORING DATA AND DATA FROM IN SITU RESPIRATION TESTS

Soil Gas Monitoring Data

IN SITU RESPIRATION TEST				SG-30		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	19	1.75	520	
3-May-96	14:44	11	15	3.5	6400	
3-May-96	14:44	17	18.5	1.75	2000	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	15	4	>10000	
10-May-96	8:26	11	10	6	>10000	
10-May-96	8:26	17	19	1.9	>10000	
10-May-96	8:26	24				NO FLOW
15-May-96	15:31	5	14	3.75	>10000	
15-May-96	15:31	11	9.5	6.5	>10000	
15-May-96	15:31	17	19.5	1.5	>10000	
15-May-96	15:31	24				NO FLOW
7-Jun-96	9:37	5	16.5	0.25	100	
7-Jun-96	9:37	11	17	0.75	280	
7-Jun-96	9:37	17	19.5	0.5	230	
7-Jun-96	9:37	24				NO FLOW
17-Jun-96	9:07	5	20	0.75	>10000	
17-Jun-96	9.07	11	19.5	0.75	>10000	
17-Jun-96	9:07	17	15.5	3.5	>10000	
17-Jun-96	9:07	24	1950	20.5	0.25	
IN SITU RESPIRATION TEST				SG-31		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	18	2.75	8200	
3-May-96	14:44	11	7	9.5	>10000	
3-May-96	14:44	17	14.5	5	>10000	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	18	3.5	1200	
10-May-96	8:26	11	6	11	>10000	
10-May-96	8:26	17	19	1.5	>10000	
10-May-96	8:26	24				NO FLOW
15-May-96	15:26	5	18.5	3.25	440	
15-May-96	15:26	11	6	11	>10000	
15-May-96	15:26	17	15	4.25	>10000	
15-May-96	15:26	24				NO FLOW
7-Jun-96	9:43	5	16	2.25	400	
7-Jun-96	9:43	11	12	4.75	>10000	
7-Jun-96	9:43	17	16	2.6	>10000	
7-Jun-96	9:43	24				NO FLOW

17-Jun-96	9:14	5	7.5	7.5	200	
17-Jun-96	9:14	11	7	8	>10000	
17-Jun-96	9:14	17	17.5	1.5	>10000	
17-Jun-96	9:14	24	17.5	1.25	>10000	NO FLOW
IN SITU RESPIRATION TEST				**SG-33**		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	20	1	9800	
3-May-96	14:44	11	5.5	6.5	5400	
3-May-96	14:44	17	11	5.5	>10000	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	20	1.5	7500	
10-May-96	8:26	11	7	8	>10000	
10-May-96	8:26	17	11	6.5	>10000	
10-May-96	8:26	24				NO FLOW
15-May-96	15:21	5	20.5	1.25	950	
15-May-96	15:21	11	9	15	540	
15-May-96	15:21	17	10	6.75	>10000	
15-May-96	15:21	24				NO FLOW
7-Jun-96	9:51	5	20	1	250	
7-Jun-96	9:51	11	13	3.75	1200	
7-Jun-96	9:51	17	14	4	>10000	
7-Jun-96	9:51	24	21	0	360	
17-Jun-96	9:20	5	19.5	1.5	20	
17-Jun-96	9:20	11	17	2	49	
17-Jun-96	9:20	17	16.5	3	>10000	
17-Jun-96	9:20	24	20.5	0.5	1000	NO FLOW
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	19	1.75	320	
3-May-96	14:44	11				NO FLOW
3-May-96	14:44	17	17	4	>10000	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	19	1.5	>10000	
10-May-96	8:26	11				NO FLOW
10-May-96	8:26	17	17	4.5	>10000	
10-May-96	8:26	24				NO FLOW
15-May-96	15:07	5	19.5	2	320	
15-May-96	15:07	11				NO FLOW
15-May-96	15:07	17	19	4	4300	
15-May-96	15:07	24	0.5	4	3000	

7-Jun-96	9:57	5	17	0.5	700	
7-Jun-96	9:57	11				NO FLOW
7-Jun-96	9:57	17	19.5	1	>10000	
7-Jun-96	9:57	24				NO FLOW
17-Jun-96	9:26	5	17.5	1.5	7300	
17-Jun-96	9:26	11	20.5	0.25	190	
17-Jun-96	9:26	17	19.5	1	1000	
17-Jun-96	9:26	24	20	0.25	7900	
IN SITU RESPIRATION TEST				**SG-36**		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	2	8	1000	
3-May-96	14:44	11	2	9	5600	
3-May-96	14:44	17	12	4.5	>10000	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	1	10	3300	
10-May-96	8:26	11	1	12	7100	
10-May-96	8:26	17	14	4	>10000	
10-May-96	8:26	24	20	0.5	>10000	
15-May-96	15:00	5	6.5	9	900	
15-May-96	15:00	11	1	11.75	5400	
15-May-96	15:00	17	14	4	>10000	
15-May-96	15:00	24	21	1	820	
7-Jun-96	10:03	5	7	1.25	1000	
7-Jun-96	10:03	11				NO FLOW
7-Jun-96	10:03	17	19	0.75	5000	
7-Jun-96	10:03	24				NO FLOW
17-Jun-96	9:33	5	6	6.75	8200	
17-Jun-96	9:33	11	6	3.5	660	
17-Jun-96	9:33	17	18	1.75	>10000	
17-Jun-96	9:33	24	20.5	0.25	480	NO FLOW
IN SITU RESPIRATION TEST				**SG-37**		
SOUTHWEST TANKS						
				RECORDED BY:		BAH
DATE	TIME	DEPTH	O2	CO2	TPH	COMMENT
3-May-96	14:44	5	18.5	1.5	7000	
3-May-96	14:44	11				NO FLOW
3-May-96	14:44	17	20	1.5	680	
3-May-96	14:44	24				NO FLOW
10-May-96	8:26	5	19	3	5200	
10-May-96	8:26	11				NO FLOW
10-May-96	8:26	17	20	1.5	6800	
10-May-96	8:26	24				NO FLOW

15-May-96	15:13	5	19	3	>10000	
15-May-96	15:13	11				NO FLOW
15-May-96	15:13	17	20.5	1	5800	
15-May-96	15:13	24				NO FLOW
7-Jun-96	10:10	5	18.5	2	120	
7-Jun-96	10:10	11	19	0.5	70	
7-Jun-96	10:10	17	18	0.75	9800	
7-Jun-96	10:10	24	19	0	3000	
17-Jun-96	9:40	5	18.5	2.75	72	
17-Jun-96	9:40	11	15	2	1700	
17-Jun-96	9:40	17	17	2	>10000	
17-Jun-96	9:40	24				NO FLOW

Table F-2. Data from first in situ respiration test conducted 3/18/96.

IN SITU RESPIRATION TEST					SG-30	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:10	-0.07	20.2	0.5	120	
18-Mar-96	18:10	0.10	19.5	0.75	950	
18-Mar-96	21:50	0.25	18.2	1.4	1500	START OF 20 SEC PURGE
19-Mar-96	8:10	0.68	16.8	2.1	4000	
19-Mar-96	8:44	0.71	16.9	2.2	8800	
19-Mar-96	15:10	0.98	16.4	2.5	11000	
20-Mar-96	7:54	1.67	18.3	1.7	11000	
20-Mar-96	15:47	2.00	16.2	2.2	11000	
21-Mar-96	9:10	2.73	16.7	2.3	11000	READ: O2=7, CO2=13.9
21-Mar-96	13:10	2.89	14.9	2.6	11000	
22-Mar-96	10:11	3.77	14	2	11000	
22-Mar-96	14:06	3.93	14	3	11000	
	Oxygen Respiration Rate =			-0.95	%O2/day	
IN SITU RESPIRATION TEST				SG-30		
SOUTHWEST TANKS				DEPTH:		11 FT(BLUE)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:30	-0.07	18.5	1.5	2750	
18-Mar-96	18:10	0.10	16.9	2.3	4300	
18-Mar-96	21:50	0.25	15.3	3.4	11000	START OF 20 SEC PURGE
19-Mar-96	8:10	0.68	15.5	3.3	11000	
19-Mar-96	8:44	0.71	15	3.2	11000	
19-Mar-96	15:10	0.98	15	3.2	11000	
20-Mar-96	7:54	1.67	15.6	3.4	11000	
20-Mar-96	15:47	2.00	15.6	2.9	11000	
21-Mar-96	9:10	2.73	12.3	4.1	11000	
21-Mar-96	13:10	2.89	12.3	3.7	11000	
22-Mar-96	10:11	3.77	10	5	11000	
22-Mar-96	14:06	3.93	12	4	11000	
	Oxygen Respiration Rate =			-1.3	%O2/day	

IN SITU RESPIRATION TEST				SG-30		
SOUTHWEST TANKS				DEPTH:		17 FT(BROWN)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:10	-0.07	18	1.7	2600	
18-Mar-96	18:10	0.10	16.2	2.6	9900	
18-Mar-96	21:50	0.25	18	1.4	11000	START OF 20 SEC PURGE
19-Mar-96	8:10	0.68	19	1.2	11000	
19-Mar-96	8:44	0.71	18	0.9	11000	
19-Mar-96	15:10	0.98	18.1	1.2	11000	
20-Mar-96	7:54	1.67	18.1	1.3	11000	
20-Mar-96	15:47	2.00	18	1.2	11000	
21-Mar-96	9:10	2.73	17.7	1.8	11000	
21-Mar-96	13:10	2.89	17.5	1.4	11000	
22-Mar-96	10:11	3.77	17	2	11000	
22-Mar-96	14:07	3.93	17	1.5	11000	
	Oxygen Respiration Rate =			-0.37	%O2/day	
IN SITU RESPIRATION TEST				SG-30		
SOUTHWEST TANKS				DEPTH:		24 FT(ORANGE)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:30					NO FLOW
IN SITU RESPIRATION TEST				SG-30		
SOUTHWEST TANKS				DEPTH:		30 FT(YELLOW)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:30	-0.07	20.5	0.3	820	
18-Mar-96	18:10	0.10	17.9	1.6	NRI	
18-Mar-96	21:45	0.25				NO FLOW
IN SITU RESPIRATION TEST				SG-30		

SOUTHWEST TANKS				DEPTH:		36 FT(RED)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44		RECORDED BY:		BMP
DATE	TIME	E. TIME (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:30					NO FLOW
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48	-0.04	14	3.5	11000	
18-Mar-96	18:05	0.10	11.8	5	11000	
18-Mar-96	21:45	0.25	15.8	3	11000	START OF 20 SEC PURGE
19-Mar-96	8:15	0.69	17.5	2.9	1250	
19-Mar-96	8:50	0.71	17	2	2100	
19-Mar-96	15:20	0.98	17	2	3100	
20-Mar-96	7:50	1.67	15.6	2.3	11000	
20-Mar-96	15:53	2.01	14.4	1.7	3400	
21-Mar-96	9:06	2.72	14.9	1.2	11000	READ: O2=7.2, CO2=13.8 TPH=4500
21-Mar-96	13:05	2.89	12.5	1.4	3500	
22-Mar-96	10:02	3.76	12	2	2600	
22-Mar-96	14:10	3.93	8	1.8	3800	
	Oxygen Respiration Rate =			-2.0	%O2/day	
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48	-0.04	6.5	7.3	11000	
18-Mar-96	18:05	0.10	13	4.9	11000	
18-Mar-96	21:45	0.25	10	7	11000	START OF 20 SEC PURGE
19-Mar-96	8:15	0.69	9.3	7.9	11000	
19-Mar-96	8:50	0.71	12.9	6	11000	PROBABLY LEAKS, RL APPROX = 0.38
19-Mar-96	15:20	0.98	13.5	5.5	11000	
20-Mar-96	7:50	1.67	12.2	6.5	11000	
20-Mar-96	15:53	2.01	12.9	5.9	11000	
21-Mar-96	9:06	2.72	13.4	5.6	11000	
21-Mar-96	13:05	2.89	15.6	3.9	11000	

22-Mar-96	10:03	3.76	12	5.5	11000	
22-Mar-96	14:10	3.93	13	5.5	11000	
	Oxygen Respiration Rate =			0.68	%O2/day	
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48	-0.04	10.5	6.5	11000	
18-Mar-96	18:05	0.10	15.8	3.7	11000	
18-Mar-96	21:45	0.25	15.2	3.5	11000	START OF 20 SEC PURGE
19-Mar-96	8:15	0.69	15.3	3.8	11000	
19-Mar-96	8:50	0.71	15.1	3.8	11000	
19-Mar-96	15:20	0.98	15	3.9	11000	
20-Mar-96	7:50	1.67	15.1	4.2	11000	
20-Mar-96	15:53	2.01	14.7	4.2	11000	
21-Mar-96	9:06	2.72	14.8	4.3	11000	
21-Mar-96	13:05	2.89	14.7	3.9	11000	
22-Mar-96	10:03	3.76	14	3.5	11000	
22-Mar-96	14:10	3.93	14	4.5	11000	
	Oxygen Respiration Rate =			-0.32	%O2/day	
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48	-0.93	17	2.1	11000	
18-Mar-96	18:05	2.35	10	6.8	11000	
18-Mar-96	21:45	6.02	12.9	4.3	11000	START OF 20 SEC PURGE.
19-Mar-96	8:15	16.52	12.4	4.2	11000	
19-Mar-96	8:50	17.10				NO FLOW
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	30 FT(YELLOW)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY:	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48					NO FLOW

IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	36 FT(RED)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	14:48					NO FLOW

IN SITU RESPIRATION TEST					SG-33	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00	-0.03	20.9	0.1	0	
18-Mar-96	18:00	0.09	20.5	0.1	520	
18-Mar-96	22:00	0.26	20.9	0.6	470	START OF 20 SEC PURGE
19-Mar-96	8:00	0.68	20	0.8	410	
19-Mar-96	8:40	0.71	19	0.8	2800	
19-Mar-96	15:00	0.97	19	0.75	2900	
20-Mar-96	8:00	1.68	18.4	1.2	4900	
20-Mar-96	15:38	2.00	17.9	1.3	4900	
21-Mar-96	9:45	2.75	19.4	0.9	1400	O2=7, CO2=13.9
21-Mar-96	13:00	2.89	19.8	0.8	1200	
22-Mar-96	10:08	3.77	18	1	480	
22-Mar-96	14:16	3.94	18	1	400	
	Oxygen Respiration Rate =			-0.45	% O2/day	

IN SITU RESPIRATION TEST					SG-33	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00	-0.03	20.5	0.2	100	
18-Mar-96	18:00	0.09	18.3	1.75	9200	
18-Mar-96	22:00	0.26	20	0.7	900	START OF 20 SEC PURGE
19-Mar-96	8:00	0.68	15.6	2.2	11000	
19-Mar-96	8:40	0.71	15.4	2.6	11000	
19-Mar-96	15:00	0.97	15.5	2.6	11000	
20-Mar-96	8:00	1.68	13	3.8	11000	
20-Mar-96	15:38	2.00	12.5	4.2	11000	
21-Mar-96	9:45	2.75	11.4	4.6	11000	
21-Mar-96	13:00	2.89	12.2	4.2	11000	
22-Mar-96	10:07	3.77	11	5	11000	
22-Mar-96	14:17	3.94	12	4.5	11000	

	Oxygen Respiration Rate =			-1.3	% O2/day	
IN SITU RESPIRATION TEST				SG-33		
SOUTHWEST TANKS				DEPTH:	17 FT(BROWN)	
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00	-0.03	20.5	0.09	100	
18-Mar-96	18:00	0.09	19.2	0.8	6000	
18-Mar-96	22:00	0.26	16.5	2.6	11000	START OF 20 SEC PURGE
19-Mar-96	8:00	0.68	14.7	3.3	11000	
19-Mar-96	8:40	0.71	13.8	3.6	11000	
19-Mar-96	15:00	0.97	13.3	3.3	11000	
20-Mar-96	8:06	1.68	13.2	4.3	11000	
20-Mar-96	15:38	2.00	12.9	4.2	11000	
21-Mar-96	9:45	2.75	13	4.2	11000	
21-Mar-96	13:00	2.89	13	4.1	11000	
22-Mar-96	10:07	3.77	13	4.5	11000	
22-Mar-96	14:17	3.94	13	4.25	11000	
	Oxygen Respiration Rate =			-.34	% O2/day	
IN SITU RESPIRATION TEST				SG-33		
SOUTHWEST TANKS				DEPTH:	24 FT(ORANGE)	
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00	-0.03				NO FLOW
IN SITU RESPIRATION TEST				SG-33		
SOUTHWEST TANKS				DEPTH:	30 FT(YELLOW)	
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00	-0.03				NO FLOW
IN SITU RESPIRATION TEST				SG-33		
SOUTHWEST TANKS				DEPTH:		36 FT(RED)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT

18-Mar-96	15:00	-0.03	20.5	0.5	2100	
18-Mar-96	18:00	0.09	20.7	0.1	250	
18-Mar-96	22:00	0.26	21	0	0	LEAKS, 20 SEC PURGE, HIGH VACUUM
19-Mar-96	8:00	0.68	21	0	0	VERY HIGH VACUUM NEEDED
19-Mar-96	8:40	0.71				TIGHTENED NUT AND DREW WATER. **NO FLOW.**

IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**		**5 FT(GREEN)**
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40	-0.04	16.8	1.9	3000	
18-Mar-96	17:53	0.09	15.9	2.5	4100	
18-Mar-96	22:10	0.27	12.3	3.7	6200	START OF 20 SEC PURGE
19-Mar-96	7:50	0.67	17.5	2.5	2100	
19-Mar-96	8:25	0.70	18.9	1.7	2500	
19-Mar-96	14:45	0.96	19.7	1	750	
20-Mar-96	8:15	1.69	19.7	1.4	800	
20-Mar-96	16:07	2.02	19.4	0.8	340	
21-Mar-96	9:20	2.73	19.4	1.2	500	
21-Mar-96	13:20	2.90	19.3	0.9	400	
22-Mar-96	10:19	3.77	19	1	520	
22-Mar-96	14:29	3.95	19	1	180	
	Oxygen Respiration Rate =			-0.025	% O2/day	
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**		**11 FT(BLUE)**
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40					**NO FLOW**
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**	**17 FT(BROWN)**	
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**		**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40	-0.04	18.5	1	2200	
18-Mar-96	17:53	0.09	20	0.8	2150	
18-Mar-96	22:10	0.27	19.7	0.8	2000	START OF 20 SEC PURGE

19-Mar-96	7:50	0.67	20	0.7	1500	
19-Mar-96	8:25	0.70	20.1	0.4	4700	
19-Mar-96	14:45	0.96	20	0.5	1100	
20-Mar-96	8:15	1.69	20.2	0.75	1250	
20-Mar-96	16:07	2.02	20	0.6	1200	
21-Mar-96	9:20	2.73	20.3	0.8	1300	
21-Mar-96	13:20	2.90	19.8	0.8	1300	
22-Mar-96	10:19	3.77	20	1	1400	
22-Mar-96	14:29	3.95	19.5	1	1200	
	Oxygen Respiration Rate =			-0.04	% O2/day	
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**	**24 FT(ORANGE)**	
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40					NO FLOW
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**	**30 FT(YELLOW)**	
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40					NO FLOW
IN SITU RESPIRATION TEST				**SG-35**		
SOUTHWEST TANKS				**DEPTH:**	**36 FT(RED)**	
SHUTDOWN DATE:		**3/18/96**				
SHUTDOWN TIME:		**15:44**			**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	14:40					NO FLOW

IN SITU RESPIRATION TEST					**SG-36**	
SOUTHWEST TANKS					**DEPTH:**	**5 FT(GREEN)**
SHUTDOWN DATE:			**3/18/96**			
SHUTDOWN TIME:			**15:44**		**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	15:00	-0.030556	17	2.4	1050	
18-Mar-96	17:50	0.0875	17.5	2.1	1000	
18-Mar-96	22:30	0.281944	12.4	4.5	1150	START OF 20 SEC PURGE

19-Mar-96	7:45	0.667361	12.6	4.7	1000	
19-Mar-96	9:10	0.726389	14.4	3.6	800	
19-Mar-96	14:30	0.948611	15.7	3.3	900	
20-Mar-96	8:26	1.695833	11.8	4	700	READ: CO2=13.7, O2=7.2
20-Mar-96	15:59	2.010417	10.4	4.2	950	TPH CAL GAS=4764, READ 4500
21-Mar-96	9:30	2.740278	9.6	4.3	1000	TPH = 4500
21-Mar-96	13:17	2.897917	8.6	4.2	1500	
22-Mar-96	10:23	3.777083	7	4.5	900	
22-Mar-96	14:24	3.944444	6.25	4.5	880	
	Oxygen Respiration Rate =			-2.12	% O2/day	
IN SITU RESPIRATION TEST					**SG-36**	
SOUTHWEST TANKS					**DEPTH:**	**11 FT(BLUE)**
SHUTDOWN DATE:			**3/18/96**			
SHUTDOWN TIME:			**15:44**		**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	15:00	-0.030556	18.9	1.2	150	
18-Mar-96	17:50	0.0875	18.9	1.2	580	
18-Mar-96	22:30	0.281944	18.1	1.2	970	START OF 20 SEC PURGE
19-Mar-96	7:45	0.667361	18.5	0.9	600	
19-Mar-96	9:10	0.726389	15.3	1.4	1500	
19-Mar-96	14:30	0.948611	10.4	1.8	3000	
20-Mar-96	8:26	1.695833	4.5	2.7	4800	
20-Mar-96	8:35	1.702083	3	3.4	6100	
20-Mar-96	15:59	2.010417	2	3.2	6300	
21-Mar-96	9:30	2.740278	0.8	3	6800	
21-Mar-96	13:17	2.897917	0.4	2.9	6900	
22-Mar-96	10:23	3.777083	0.5	2.5	4200	
22-Mar-96	14:24	3.944444	1	3.25	6000	
	Oxygen Respiration Rate =			-5.1	% O2/day	
IN SITU RESPIRATION TEST					**SG-36**	
SOUTHWEST TANKS					**DEPTH:**	**17 FT(BROWN)**
SHUTDOWN DATE:			**3/18/96**			
SHUTDOWN TIME:			**15:44**		**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	15:00	-0.030556	20.5	0.5	2000	
18-Mar-96	17:50	0.0875	18.8	1.7	6200	
18-Mar-96	22:30	0.281944	14.3	4.2	11000	START OF 20 SEC PURGE
19-Mar-96	7:45	0.667361	13.6	4.6	11000	
19-Mar-96	9:10	0.726389	13.8	4.2	11000	

19-Mar-96	14:30	0.948611	13.6	4.6	11000	
20-Mar-96	8:26	1.695833	13.4	4.9	11000	
20-Mar-96	15:59	2.010417	13.7	4.7	11000	
21-Mar-96	9:30	2.740278	13.5	5	11000	
21-Mar-96	13:17	2.897917	13.7	4.5	11000	
22-Mar-96	10:23	3.777083	13.5	5.25	11000	
22-Mar-96	14:24	3.944444	16.25	4	11000	
	Oxygen Respiration Rate =			-0.12	% O2/day	
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY:	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00					NO FLOW
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	30 FT(YELLOW)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY:	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00		17	2	>10000	
18-Mar-96	17:50		20.9	0.05	1200	
18-Mar-96	22:30					NO FLOW
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	36 FT(RED)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY:	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:00		19.2	1.1	6100	
18-Mar-96	17:50		20.9	0.05	1550	
18-Mar-96	22:30					NO FLOW

IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			3/18/96			
SHUTDOWN TIME:			15:44		RECORDED BY:	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT

18-Mar-96	15:10	-0.023611	15.1	2	11000	
18-Mar-96	17:50	0.0875	14.1	2.4	3100	
18-Mar-96	22:40	0.288889	15.5	2.4	40	START OF 20 SEC PURGE
19-Mar-96	7:40	0.663889	19.3	1.6	2800	
19-Mar-96	9:05	0.722917	19.8	1	5400	
19-Mar-96	14:39	0.954861	19.6	0.75	700	
20-Mar-96	8:20	1.691667	19.2	1.3	2750	
20-Mar-96	16:04	2.013889	20.3	0.8	950	
21-Mar-96	9:55	2.757639	20.6	0.8	360	
21-Mar-96	13:30	2.906944	20.5	0.6	400	
22-Mar-96	10:15	3.771528	20.5	0.8	400	
22-Mar-96	14:20	3.941667	20.5	0.5	600	
	Oxygen Respiration Rate =			0.36	% O2/day	
IN SITU RESPIRATION TEST					**SG-37**	
SOUTHWEST TANKS					**DEPTH:**	**11 FT(BLUE)**
SHUTDOWN DATE:			**3/18/96**			
SHUTDOWN TIME:			**15:44**		**RECORDED BY:**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	15:10	-0.023611	5.4	3.9	11000	
18-Mar-96	17:50	0.0875	14.6	1.8	5150	
18-Mar-96	22:40	0.288889				**NO FLOW**
IN SITU RESPIRATION TEST					**SG-37**	
SOUTHWEST TANKS					**DEPTH:**	**17 FT(BROWN)**
SHUTDOWN DATE:			**3/18/96**			
SHUTDOWN TIME:			**15:44**		**RECORDED BY: BMP**	
DATE	**TIME**	**E. Time (d)**	**O2**	**CO2**	**TPH**	**COMMENT**
18-Mar-96	15:10	-0.023611	16.2	2.3	11000	
18-Mar-96	17:50	0.0875	16.2	2.2	11000	
18-Mar-96	22:40	0.288889	16.5	2.5	11000	START OF 20 SEC PURGE
19-Mar-96	7:40	0.663889	17	2.4	11000	
19-Mar-96	9:05	0.722917	16.8	2.4	11000	
19-Mar-96	14:39	0.954861	17	1.4	11000	
20-Mar-96	8:20	1.691667	17.2	1.5	11000	
20-Mar-96	16:04	2.013889	17	2.4	11000	
21-Mar-96	9:55	2.757639	17.1	2.6	11000	
21-Mar-96	13:30	2.906944	17	2.5	11000	
22-Mar-96	10:15	3.771528	17.5	2.8	11000	
22-Mar-96	14:20	3.941667	17	2.5	11000	
	Oxygen Respiration Rate =			0.13	% O2/day	

IN SITU RESPIRATION TEST					SG-30	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:35	-1.0	0.0	5.0		TPH meter noisy.
18-Jun-96	11:40	-0.9	0.5	4.9	11000	
18-Jun-96	13:05	-0.8	4.5	4.1	11000	
18-Jun-96	19:00	-0.6	2.2	4.6	6000	
19-Jun-96	7:10	-0.1	1.5	4.8	11000	
19-Jun-96	10:25	0.1	4.0	3.8	9900	
19-Jun-96	19:55	0.5	1.2	3.9	5600	
20-Jun-96	15:43	1.3	7.0	3.5	11000	
21-Jun-96	7:06	1.9	11.0	3.5	11000	some water pulled.
21-Jun-96	14:41	2.3	9.0	3.0	11000	some water pulled.
	Oxygen Respiration Rate =		3.7	% O2/day		
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:02	-1.0	16.0	4.0		not enough sample.
18-Jun-96	12:30	-0.8	15.7	3.4	1200	
18-Jun-96	16:00	-0.7	16.0	3.5	1400	
18-Jun-96	19:40	-0.5	15.6	3.4	1600	
19-Jun-96	7:45	0.0	16.1	3.3	800	
19-Jun-96	10:20	0.1	16.1	3.2	860	
19-Jun-96	19:40	0.5	15.4	3.3	580	
20-Jun-96	8:09	1.0	12.5	3.3	700	
20-Jun-96	15:43	1.3	13.5	1.5	11000	
21-Jun-96	7:08	1.9	18.0	1.0	11000	
21-Jun-96	14:46	2.3	18.0	0.5	11000	
24-Jun-96	8:44	5.0	10.0	4.0	660	
25-Jun-96	7:55	6.0	9.0	4.0	11000	
	Oxygen Respiration Rate =		-1.1	% O2/day		
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			

IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:10					NO FLOW
IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	30 FT(YELLOW)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96						NO FLOW
IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	36 FT(RED)
SHUTDOWN DATE:		3/18/96				
SHUTDOWN TIME:		15:44			RECORDED BY: BMP	
DATE	TIME	E. Time (d)	O2	CO2	TPH	COMMENT
18-Mar-96	15:10					NO FLOW

IN SITU RESPIRATION TEST					SG-30	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:17	-1.0	20.0	0.0	560	
18-Jun-96	11:40	-0.9	19.8	0.5	220	
18-Jun-96	15:05	-0.7	19.0	0.6	0	
18-Jun-96	19:00	-0.6	20.0	0.6	100	
19-Jun-96	7:10	-0.1	21.0	0.7	110	
19-Jun-96	10:25	0.1	20.5	0.6	250	
19-Jun-96	19:55	0.5	20.1	0.6	420	
20-Jun-96	8:02	1.0	19.0	0.8	570	
20-Jun-96	15:43	1.3	12.0	3.0	760	
21-Jun-96	7:06	1.9	12.0	2.5	1100	
21-Jun-96	14:41	2.3	11.0	3.0	960	
24-Jun-96	8:40	5.0	14.5	2.8	11000	
25-Jun-96	7:59	6.0	13.5	3.3	11000	
	Oxygen Rate =	Respiration	-0.9	% O2/day		

IN SITU RESPIRATION TEST					SG-30	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:29	-1.0	19.0	0.8	980	
18-Jun-96	11:40	-0.9	19.0	0.8	810	
18-Jun-96	15:05	-0.7	19.0	1.0	1010	
18-Jun-96	19:00	-0.6	18.9	1.1	800	
19-Jun-96	7:10	-0.1	18.0	2.1	11000	
19-Jun-96	10:25	0.1	18.5	1.8	11000	
19-Jun-96	19:55	0.5	17.5	2.6	11000	
20-Jun-96	8:02	1.0	16.5	2.8	11000	
20-Jun-96	13:46	1.2	19.0	1.8	8400	
21-Jun-96	7:06	1.9	19.0	1.5	9200	
21-Jun-96	14:41	2.3	19.0	1.5	9000	
24-Jun-96	8:40	5.0	12.3	4.8	11000	
25-Jun-96	7:59	6.0	13.0	5.0	11000	
	Oxygen Respiration Rate =		-1.1	% O2/day		
IN SITU RESPIRATION TEST					SG-30	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:25	-1.0	16.0	2.3	11000	
18-Jun-96	11:40	-0.9	13.0	4.2	11000	
18-Jun-96	13:05	-0.8	13.5	4.1	11000	
18-Jun-96	19:00	-0.6	13.5	4.5	11000	
19-Jun-96	7:10	-0.1	15.1	4.2	11000	
19-Jun-96	10:25	0.1	17.1	3.3	11000	
19-Jun-96	19:55	0.5	18.2	2.3	11000	
20-Jun-96	8:02	1.0	17.5	2.1	11000	
20-Jun-96	15:43	1.3	20.0	0.5	6600	
21-Jun-96	7:06	1.9	20.0	0.5	5000	
21-Jun-96	14:41	2.3	20.0	0.5	4800	
24-Jun-96	8:40	5.0	15.5	3.3	11000	
25-Jun-96	7:59	6.0	16.0	3.5	11000	
	Oxygen Respiration Rate =		-0.5	% O2/day		

SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	8:55	-1.0	16.0	2.6	11000	
18-Jun-96	10:07	-0.9	17.0	2.3	11000	
18-Jun-96	10:26	-0.9	17.6	2.0	11000	
18-Jun-96	10:40	-0.9	18.0	1.5	11000	
18-Jun-96	12:30	-0.8	18.5	1.8	11000	
18-Jun-96	16:00	-0.7	19.3	1.8	6200	
18-Jun-96	19:40	-0.5	19.5	1.3	3000	
19-Jun-96	7:45	0.0	20.5	1.1	1700	
19-Jun-96	10:20	0.1	20.4	1.0	1100	
19-Jun-96	19:40	0.5	19.9	1.2	2900	
20-Jun-96	8:09	1.0	19.0	1.5	5400	
20-Jun-96	15:43	1.3	16.0	3.5	11000	
21-Jun-96	7:08	1.9	16.0	3.5	11000	
21-Jun-96	14:46	2.3	16.0	3.0	11000	
24-Jun-96	8:44	5.0	14.1	4.0	11000	
25-Jun-96	7:55	6.0	15.5	4.0	11000	
	Oxygen Respiration Rate =		-0.9	% O2/day		
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
19-Jun-96	10:20	0.1	21.0	0.3	1000	
19-Jun-96	19:40	0.5	20.9	0.1	3200	He = 0.03 in field.
20-Jun-96	8:09	1.0	20.1	0.1	6500	
20-Jun-96	15:47	1.3	17.0	3.0	11000	
21-Jun-96	7:10	1.9	17.5	2.8	11000	
21-Jun-96	14:46	2.3	18.0	3.0	11000	
24-Jun-96	8:44	5.0	19.2	0.5	11000	
25-Jun-96	7:55	6.0	19.0	0.5	11000	
	Oxygen Respiration Rate =		-0.2	% O2/day		
IN SITU RESPIRATION TEST					SG-31	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT

18-Jun-96	9:08	-1.0	16.5	1.0	11000	
18-Jun-96	12:30	-0.8	17.5	0.8	11000	
18-Jun-96	16:00	-0.7	17.0	1.3	11000	
18-Jun-96	19:40	-0.5	17.0	1.0	11000	
19-Jun-96	7:45	0.0	17.5	0.9	11000	
19-Jun-96	10:20	0.1	17.0	0.9	11000	
19-Jun-96	19:40	0.5	13.9	2.0	11000	
20-Jun-96	8:09	1.0	10.9	3.5	11000	
	Oxygen Rate =	Respiration	-6.7	% O2/day		
IN SITU RESPIRATION TEST					SG-33	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	9:45	-0.9	18.0	0.6	11000	syringe
18-Jun-96	12:40	-0.8				pump
18-Jun-96	13:05	-0.8	19.1	2.2	390	pump
18-Jun-96	19:55	-0.5	19.5	1.5	190	
19-Jun-96	8:00	0.0	20.0	1.5	250	
19-Jun-96	10:20	0.1	20.5	1.3	250	
19-Jun-96	20:05	0.5	20.4	1.0	960	
20-Jun-96	8:09	1.0	17.5	1.5	0	
20-Jun-96	15:49	1.3	19.5	1.0	450	
21-Jun-96	7:14	2.0	19.0	1.0	620	
21-Jun-96	14:49	2.3	19.0	1.0	580	
24-Jun-96	8:53	5.0	19.5	1.8	220	
25-Jun-96	8:04	6.0	20.0	1.5	5600	
	Oxygen Rate =	Respiration	0.0	% O2/day		
IN SITU RESPIRATION TEST					SG-33	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	13:05	-0.8	13.9	4.9	750	
18-Jun-96	19:55	-0.5	14.0	4.9	3400	
19-Jun-96	8:00	0.0	14.0	4.6	4700	
19-Jun-96	10:30	0.1	14.5	2.0	7300	
19-Jun-96	20:05	0.5	14.0	4.2	11000	
20-Jun-96	8:09	1.0	12.5	4.5	11000	

20-Jun-96	15:49	1.3	12.0	5.0	11000	
21-Jun-96	7:14	2.0	12.0	5.0	11000	
21-Jun-96	14:49	2.3	12.0	5.0	11000	
24-Jun-96	8:53	5.0	5.0	7.5	4600	
25-Jun-96	8:04	6.0	8.0	7.3	11000	
	Oxygen Respiration Rate =		-1.4	% O2/day		
IN SITU RESPIRATION TEST					SG-33	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	13:05	-0.8	14.6	4.3	11000	
18-Jun-96	19:55	-0.5	14.9	4.3	11000	
19-Jun-96	8:00	0.0	15.0	4.0	11000	
19-Jun-96	10:30	0.1	15.0	2.8	11000	
19-Jun-96	20:05	0.5	14.5	3.7	11000	
20-Jun-96	8:09	1.0	14.9	3.8	11000	
20-Jun-96	15:47	1.3	13.9	4.0	11000	
21-Jun-96	7:14	2.0	13.5	4.5	11000	
21-Jun-96	14:49	2.3	13.5	4.5	11000	
24-Jun-96	8:53	5.0	16.0	8.5	11000	
25-Jun-96	8:04	6.0	15.0	4.5	11000	
	Oxygen Respiration Rate =		0.2	% O2/day		
IN SITU RESPIRATION TEST					SG-35	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	13:30	-0.8	18.0	1.6	100	
18-Jun-96	20:10	-0.5	19.0	1.4	0	
19-Jun-96	8:00	0.0	19.7	1.2	120	
19-Jun-96	10:15	0.1	19.1	1.3	880	
19-Jun-96	20:15	0.5	18.6	1.3	840	
20-Jun-96	8:02	1.0	17.8	1.4	62	
20-Jun-96	15:53	1.3	18.0	1.3	200	
21-Jun-96	7:18	2.0	18.2	1.0	360	
21-Jun-96	14:53	2.3	18.0	1.0	400	
24-Jun-96	8:36	5.0	17.0	1.5	260	
25-Jun-96	8:08	6.0	17.0	1.8	2200	

	Oxygen Respiration Rate =		-0.3	% O2/day		
IN SITU RESPIRATION TEST					SG-35	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96			NO FLOW			
IN SITU RESPIRATION TEST					SG-35	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	13:30	-0.8	19.0	1.9	1200	
18-Jun-96	20:10	-0.5	19.0	1.9	1100	
19-Jun-96	8:00	0.0	19.6	1.7	1100	
19-Jun-96	10:15	0.1	18.7	1.9	1100	
19-Jun-96	20:15	0.5	19.8	1.9	1400	
20-Jun-96	8:02	1.0	19.8	1.5	1000	
20-Jun-96	15:53	1.3	20.0	2.0	1000	
21-Jun-96	7:18	2.0	20.0	2.0	1000	
21-Jun-96	14:53	2.3	20.0	1.5	1000	
24-Jun-96	8:36	5.0	19.0	2.0	400	
25-Jun-96	8:08	6.0	19.0	2.0	1800	
	Oxygen Respiration Rate =		-0.1	% O2/day		
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:00	-0.8	1.5	4.8	980	
18-Jun-96	20:20	-0.5	1.0	5.2	740	
19-Jun-96	8:05	0.0	1.8	4.9	700	
19-Jun-96	10:00	0.1	1.1	5.1	610	
19-Jun-96	20:40	0.5	1.8	5.0	900	
20-Jun-96	7:50	1.0	0.8	5.5	600	
20-Jun-96	16:04	1.3	0.5	5.5	880	

21-Jun-96	7:23	2.0	0.5	5.3	940	
21-Jun-96	14:57	2.3	1.5	4.0	1050	
24-Jun-96	8:25	5.0	4.0	5.0	1000	
25-Jun-96	8:14	6.0	2.0	6.0	1100	
	Oxygen Respiration Rate =		0.4	% O2/day		
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:00	-0.8	0.0	10.0	11000	
18-Jun-96	20:20	-0.5	1.0	9.8	11000	
19-Jun-96	8:05	0.0	4.5	7.4	11000	
19-Jun-96	10:00	0.1	1.6	7.3	11000	
19-Jun-96	20:40	0.5	1.1	8.7	11000	
20-Jun-96	7:50	1.0	1.3	8.6	11000	
20-Jun-96	16:04	1.3	0.0	9.3	4400	
21-Jun-96	7:23	2.0	1.2	9.0	6200	
21-Jun-96	14:57	2.3	1.0	10.0	7000	
24-Jun-96	8:25	5.0	4.0	8.0	11000	
25-Jun-96	8:14	6.0	3.0	9.0	11000	
	Oxygen Respiration Rate =		0.5	% O2/day		
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:00	-0.8	8.3	2.5	11000	
18-Jun-96	20:20	-0.5	17.4	2.3	11000	
19-Jun-96	8:05	0.0	18.2	1.9	9400	
19-Jun-96	10:00	0.1	19.0	1.8	7300	
19-Jun-96	20:40	0.5	19.3	1.6	5400	
20-Jun-96	7:50	1.0	19.1	1.4	3600	
20-Jun-96	16:04	1.3	19.0	1.5	2700	
21-Jun-96	7:23	2.0	19.0	1.5	3000	
21-Jun-96	14:57	2.3	19.0	1.5	3000	
24-Jun-96	8:24	5.0	20.0	2.0	2200	
25-Jun-96	8:14	6.0	18.0	2.0	3000	

	Oxygen Rate =	Respiration	-0.1	% O2/day		
IN SITU RESPIRATION TEST					SG-36	
SOUTHWEST TANKS					DEPTH:	24 FT(ORANGE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:00	-0.8	20.0	0.0	760	
18-Jun-96	20:20	-0.5	20.0	0.3	140	
19-Jun-96	8:05	0.0	21.0	0.3	210	
19-Jun-96	10:00	0.1	20.8	0.5	4200	
IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	5 FT(GREEN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:25	-0.8	18.9	2.7	0	
18-Jun-96	20:40	0.5	19.6	1.9	0	
19-Jun-96	8:10	0.0	20.4	1.3	610	
19-Jun-96	10:10	0.1	20.6	1.2	50	
19-Jun-96	20:35	0.5	20.8	0.9	340	
20-Jun-96	8:00	1.0	20.5	0.8	0	
20-Jun-96	15:57	1.3	20.5	0.8	180	
21-Jun-96	7:31	2.0	20.0	0.9	210	
21-Jun-96	15:04	2.3	20.0	1.0	160	
24-Jun-96	8:31	5.0	20.0	1.5	260	
25-Jun-96	8:11	6.0	20.0	1.0	700	
	Oxygen Rate =	Respiration	-0.1	% O2/day		
IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	11 FT(BLUE)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:25	-0.8	14.2	4.0	0	
18-Jun-96	20:40	-0.5	14.1	4.0	11000	
19-Jun-96	8:10	0.0	14.2	4.0	11000	
19-Jun-96	10:10	0.1	15.0	3.4	11000	

19-Jun-96	20:35	0.5	15.9	3.1	11000	
20-Jun-96	8:00	1.0	15.4	3.3	11000	
20-Jun-96	15:57	1.3	16.0	3.5	11000	
21-Jun-96	7:31	2.0	16.0	3.0	11000	
21-Jun-96	15:04	2.3	16.5	2.0	11000	
24-Jun-96	8:31	5.0	14.0	5.0	3600	
25-Jun-96	8:11	6.0	15.0	5.0	4200	
	Oxygen Rate =	Respiration	-0.2	% O2/day		
IN SITU RESPIRATION TEST					SG-37	
SOUTHWEST TANKS					DEPTH:	17 FT(BROWN)
SHUTDOWN DATE:			19-Jun-96			
SHUTDOWN TIME:			8:26		RECORDED BY: BMP	
DATE	TIME	Elapsed time (d)	O2	CO2	TPH	COMMENT
18-Jun-96	14:25	-0.8	16.0	2.6	11000	
18-Jun-96	20:40	-0.5	15.8	2.8	11000	
19-Jun-96	8:10	0.0	16.3	2.7	11000	
19-Jun-96	10:10	0.1	16.8	2.5	11000	
19-Jun-96	20:35	0.5	17.6	2.2	11000	
20-Jun-96	8:00	1.0	17.8	2.0	11000	
20-Jun-96	15:57	1.3	18.0	2.0	11000	
21-Jun-96	7:31	2.0	18.2	2.0	11000	
21-Jun-96	15:04	2.3	18.0	2.0	11000	
24-Jun-96	8:31	5.0	20.0	1.8	11000	
25-Jun-96	8:11	6.0	19.0	2.0	11000	
	Oxygen Rate =	Respiration	0.4	% O2/day		

APPENDIX H

HELIUM TRACER DATA

HELIUM TRACER DATA

Injected Helium Concentrations					
Date	Time	Elapsed	Injected		
		Time (h)	Helium %		
25-Oct	14:30	0.00	43		
25-Oct	14:35	0.08	0.12		
25-Oct	14:38	0.13	17		
25-Oct	14:40	0.17	16		
25-Oct	14:42	0.20	4.5		
25-Oct	14:44	0.23	4.6		
25-Oct	14:45	0.25	4.7		
25-Oct	15:11	0.68	3.9		
25-Oct	15:30	1.00	3.3		
25-Oct	15:48	1.30	3.2		
25-Oct	16:07	1.62	3.3		
25-Oct	16:39	2.15	3.6		
25-Oct	17:45	3.25	2.9		
25-Oct	18:36	4.10	3.3		
25-Oct	19:19	4.82	3.2		
25-Oct	20:10	5.67	6.9		
26-Oct	6:50	16.33	5.7		
26-Oct	9:38	19.13	6		
26-Oct	12:00	21.50	4.9		
26-Oct	14:40	24.17	0.36		
26-Oct	15:55	25.42	0		
27-Oct	7:48	41.30	0		
27-Oct	11:15	44.75	0		
27-Oct	13:07	46.62	0		
Helium Tracer Test 3 at Tinker AFB					
Start Time	14:30				
WELL ID	30				
Date	Time	Elapsed	Green	Blue	Brown
		Time (h)	5 ft	11 ft	17 ft
25-Oct	14:48	0.30	0.01	0.15	0.24
25-Oct	15:15	0.75	1	0.31	0.18
25-Oct	15:31	1.02	1.1	0.22	0.39
25-Oct	15:50	1.33	0.47	0.24	0.16
25-Oct	16:25	1.92	0	0.19	0.18
25-Oct	17:35	3.08	0.26	0.44	0.31
25-Oct	18:29	3.98	0.14	0.41	0.22
25-Oct	19:39	5.15	0.11	0.16	0.17
26-Oct	7:21	16.85	0.14	0.27	0.62

26-Oct	9:59	19.48	0.1	0.23	0.29
26-Oct	12:31	22.02	1	0.32	0.28
26-Oct	15:03	24.55	0.37	0.38	0.38
26-Oct	16:21	25.85	0.38	0.37	0.41
27-Oct	8:12	41.70	0.4	0.47	1.4
27-Oct	15:08	48.63	0.34	0.37	0.38
28-Oct	11:48	69.30	0.33	0.34	0.56
28-Oct	18:16	75.77	0.33	0.31	0.46
29-Oct	13:38	95.13	0.09	0.11	0.19
29-Oct	19:28	100.97	0	0.03	0.06
Start Time	14:30				
WELL ID	31				
Date	Time	Elapsed	Green	Blue	Brown
		Time (h)	Depth	Depth	Depth
25-Oct	14:54	0.40	0	0.12	0.29
25-Oct	15:13	0.72	0	0.63	0.52
25-Oct	15:41	1.18	0.01	0.25	0.28
25-Oct	16:00	1.50	0.01	0.28	0.15
25-Oct	16:30	2.00	0	0.23	1.26
25-Oct	17:30	3.00	0.04	0.26	0.31
25-Oct	18:35	4.08	0.13	1.4	1.2
25-Oct	19:45	5.25	0.12	0.69	0.57
26-Oct	7:31	17.02	0.47	1.1	1
26-Oct	10:04	19.57	0.18	0.96	1.7
26-Oct	12:37	22.12	0.22	0.77	0.82
26-Oct	15:08	24.63	0.17	0.45	0.49
26-Oct	16:27	25.95	0.18	0.52	0.53
27-Oct	8:17	41.78	0.22	0.95	1.2
27-Oct	15:14	48.73	0.2	0.86	1.1
28-Oct	11:32	69.03	0.17	0.81	0.98
28-Oct	18:21	75.85	0.17	0.79	0.96
29-Oct	13:42	95.20	0.08	0.23	0.31
29-Oct	19:31	101.02	0	0.1	0.17
Start Time	14:30				
WELL ID	33				
Date	Time	Elapsed	Green	Blue	Brown
		Time (h)	Depth	Depth	Depth
25-Oct	14:57	0.45	0	0.01	0.06
25-Oct	15:19	0.82	0.01	0.03	0.06
25-Oct	15:37	1.12	0.17	0.09	0.1
25-Oct	15:55	1.42	0.92	0.1	0.12
25-Oct	16:30	2.00	2.1	0.2	0.16
25-Oct	17:35	3.08	0.92	0.11	0.11
25-Oct	18:32	4.03	1.3	0.07	0.07

25-Oct	19:34	5.07	0.79	0.13	0.5
26-Oct	7:14	16.73	0.72	0.12	0.1
26-Oct	9:53	19.38	0.98	0.73	0.08
26-Oct	12:24	21.90	1.2	0.12	0.16
26-Oct	14:58	24.47	0.98	0.52	0.1
26-Oct	16:16	25.77	0.96	0.48	0.08
27-Oct	8:08	41.63	1.3	0.16	0.5
27-Oct	15:01	48.52	1.5	1	0.14
28-Oct	11:43	69.22	1.2	0.97	0.14
28-Oct	18:11	75.68	1.1	0.96	0.12
29-Oct	13:33	95.05	0.5	0.34	0.06
29-Oct	19:23	100.88	0	0	0
Start Time	14:30				
WELL ID	35				
Date	Time	Elapsed Time (h)	Green Depth	Blue Depth	Brown Depth
25-Oct	15:01	0.52	0	H2O	0.2
25-Oct	15:15	0.75	0.1	H2O	0.24
25-Oct	15:25	0.92	0	H2O	0.18
25-Oct	15:36	1.10	0	H2O	0.21
25-Oct	15:50	1.33	0	H2O	0.16
25-Oct	16:02	1.53	0.09	H2O	0.25
25-Oct	16:16	1.77	0	H2O	0.16
25-Oct	16:33	2.05	0	H2O	0.08
25-Oct	17:40	3.17	0	H2O	0.11
25-Oct	18:35	4.08	0.07	H2O	0.17
25-Oct	19:30	5.00	0	H2O	0.25
26-Oct	7:10	16.67	0	H2O	0.15
26-Oct	9:50	19.33	0.08	H2O	0.17
26-Oct	12:18	21.80	0.27	H2O	0.27
26-Oct	14:54	24.40	0.43	H2O	0.18
26-Oct	16:11	25.68	0.42	H2O	0.17
27-Oct	8:02	41.53	0.49	H2O	0.22
27-Oct	14:54	48.40	0.58	H2O	0.24
28-Oct	11:39	69.15	0.54	H2O	0.23
28-Oct	18:06	75.60	0.48	H2O	0.2
29-Oct	13:28	94.97	0.12	H2O	0.09
29-Oct	19:19	100.82	0.06	H2O	0
Start Time	14:30				
WELL ID	36				
Date	Time	Elapsed Time (h)	Green Depth	Blue Depth	Brown Depth
25-Oct	14:47	0.28	0.16	0.3	0.36
25-Oct	15:05	0.58	0.18	0.19	0.33

25-Oct	15:18	0.80	0.29	0.38	0.39
25-Oct	15:28	0.97	0.29	0.32	0.58
25-Oct	15:43	1.22	0.2	0.29	0.5
25-Oct	15:54	1.40	0.34	0.36	0.52
25-Oct	16:06	1.60	0.26	0.44	0.68
25-Oct	16:20	1.83	0.34	0.21	0.27
25-Oct	17:32	3.03	0.3	0.31	0.75
25-Oct	18:28	3.97	0.06	0.09	0.08
25-Oct	19:21	4.85	0.31	0.34	0.89
26-Oct	6:58	16.47	0.8	0.67	0
26-Oct	9:42	19.20	0.6	0.72	0.73
26-Oct	12:06	21.60	0.51	0.39	1
26-Oct	14:46	24.27	0.38	0.47	1
26-Oct	15:59	25.48	0.4	0.47	1.1
27-Oct	7:53	41.38	0.77	0.96	1.4
27-Oct	14:40	48.17	0.84	1	1.5
28-Oct	11:28	68.97	0.87	0.98	1.2
28-Oct	17:54	75.40	0.84	0.92	0.98
29-Oct	13:17	94.78	0.31	0.42	0.41
29-Oct	19:10	100.67	0.08	0.11	0.12
Start Time	14:30				
WELL ID	37				
Date	Time	Elapsed Time (h)	Green Depth	Blue Depth	Brown Depth
25-Oct	14:53	0.38	0	H2O	0.13
25-Oct	15:11	0.68	0.1	H2O	0.16
25-Oct	15:22	0.87	0	H2O	0.13
25-Oct	15:33	1.05	0.11	H2O	0.12
25-Oct	15:48	1.30	0	H2O	0.13
25-Oct	15:58	1.47	0.11	H2O	0.13
25-Oct	16:10	1.67	0	H2O	0.12
25-Oct	16:35	2.08	0	H2O	0.12
25-Oct	17:36	3.10	0.12	H2O	0.12
25-Oct	18:32	4.03	0	H2O	0.06
25-Oct	19:26	4.93	0	H2O	0.14
26-Oct	7:04	16.57	0.12	H2O	0.25
26-Oct	9:46	19.27	0.12	H2O	0.15
26-Oct	12:12	21.70	0.36	H2O	0
26-Oct	14:51	24.35	0.16	H2O	0
26-Oct	16:06	25.60	0.12	H2O	0
27-Oct	7:58	41.47	0	H2O	0.12
27-Oct	14:48	48.30	0	H2O	0.15
28-Oct	11:32	69.03	0.91	H2O	0.13
28-Oct	17:59	75.48	0.88	H2O	0.09
29-Oct	13:24	94.90	0.3	H2O	0.02
29-Oct	19:14	100.73	0.06	H2O	0